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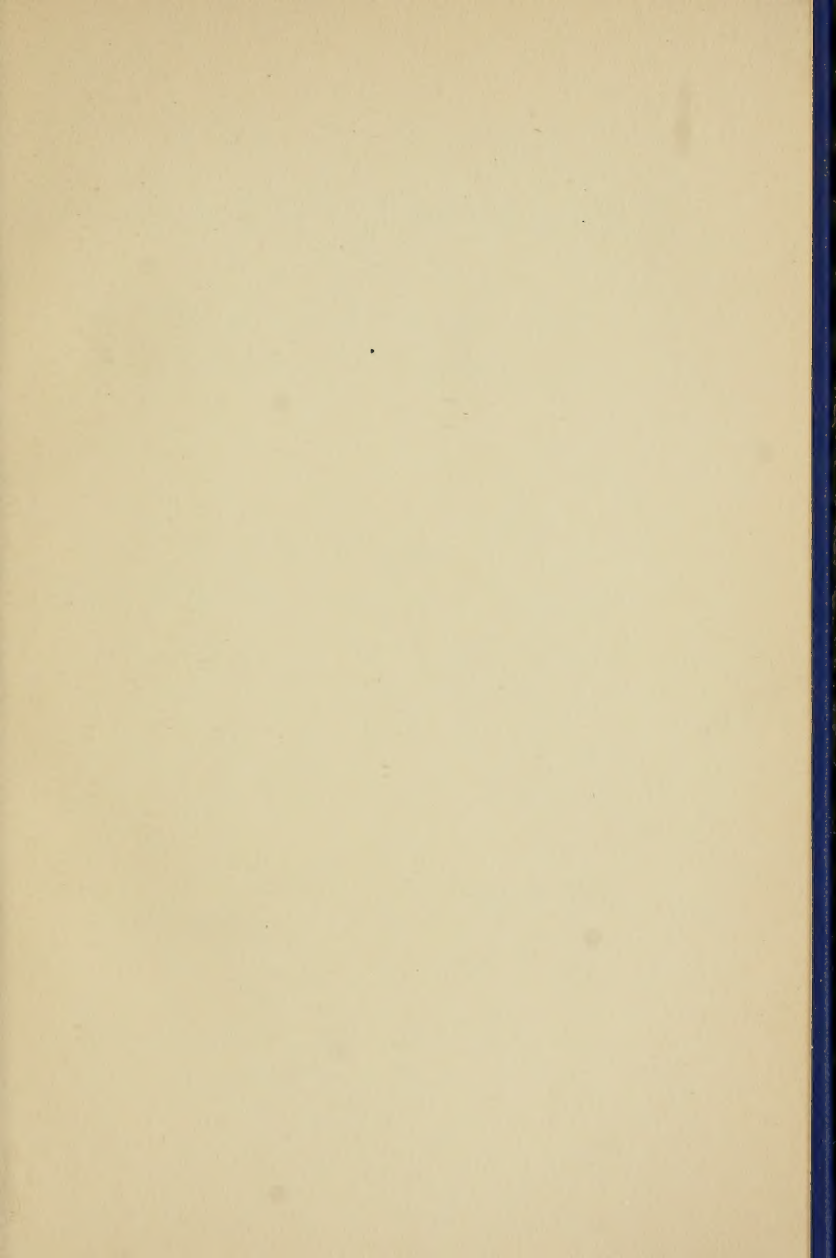
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THE N. E. A. PHONETIC ALPHABET

WITH A REVIEW OF THE
WHIPPLE EXPERIMENTS

BY

RAYMOND WEEKS

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PREFATORY NOTE.

THE experiments with the N. E. A. phonetic key alphabet, conducted by Assistant Professor Whipple, of the Cornell Psychological Laboratory, reported by him in a pamphlet recently issued, have had, with some people interested in the adoption of a scientific phonetic alphabet, an influence so out of proportion to their value and significance, that it seemed a possible service to the cause of education if one were to point out the inadequacy of Dr. Whipple's tests. The occasion has been made use of to suggest also some of the larger, more serious aspects of the problem. These may appeal to the schoolmen and educators who, as members of the N. E. A., are directly interested and concerned in the success of the alphabet, and aid them to recognize the advantages that may be secured to American schools by the adoption of a scientific phonetic alphabet for educational purposes.

Three appendixes offer information and some suggestions pertinent to the discussion.

JANUARY 22, 1912.

THE N. E. A. PHONETIC ALPHABET

IN November, 1911, appeared a pamphlet entitled "Relative Efficiency of Phonetic Alphabets" (Baltimore: Warwick & York, Inc.), by Assistant Professor Guy Montrose Whipple, giving the results of a series of experiments in the Educational Laboratory of Cornell University, to test the relative merits of one of the key-alphabets in popular use (the Webster key) and the Proposed Key of the N. E. A. Committee of the Department of Superintendence, recommended by action of the Department of Superintendence at Mobile, February, 1911, to the National Education Association at its annual session last July. Dr. Whipple has "no hesitation in declaring that the key proposed by the Committee of the National Education Association is inferior for pedagogical purposes to the Webster Key now in common use."

Inasmuch as this pamphlet from an expert in psychology must be felt by many to offer scientific support to the objections that have appeared in a number of school journals, it may not be out of place (I) 1) to restate the opinions and aims of those who favor the general introduction of a simple, rational, and scientific phonetic alphabet, 2) to point out the deficiencies of keys of the Webster kind for really effective work, whether in primary or more advanced language study, and 3) to indicate what place phonetics, and the use of a phonetic alphabet, play in the remarkable advance of training in the living languages that has during the last generation been made throughout Europe; and then (II) to point out how far from conclusive and in fact how misleading at times are the results reached by Dr. Whipple.

I

One would think that the overwhelming philological and phonetic authority behind the movement to adopt a scientific alphabet for general phonetic use would in the mind of a scientifically trained man of whatever other field of scholarship raise doubt of the sound-

ness of the ground upon which opposition to such a key took its stand. And it perhaps required some courage on the part of Dr. Whipple to put himself on record as aligned with various other influences against the sense of all American and English philological and phonetic scholarship.

There is not a reputable American or English philologist or phonetician that does not advocate the universal adoption of a scientific phonetic key, and declare a key of the Webster kind unfit for scientific uses.*

There are no indications in his pamphlet that Dr. Whipple is conscious of this weight of expert opinion in favor of a scientific key. But a brief review of the movement will enlighten anyone on that point, and will reveal further the unanimity of aim and method in the actions of the associations that have joined in the reform.

(1)

ORIGIN OF THE N. E. A. ALPHABET

The movement began in 1877, when the American Philological Association agreed upon an alphabet, the distinguishing features of which were the use of the vowel letters *a e i o u* in their Latin values, and the addition of three new forms *ā ē ū*. There were thus eight vowel symbols, *ā a e i o ē u u†*, which, marked (with a macron or otherwise), represented the long vowels heard in the words *art air they eve note north rude burn*; unmarked, they represented corresponding short vowels. To make the alphabet easy of adoption for popular use, some consonant signs were retained that were later discarded, such as *c* as an alternative to *k*, *q* and *x* as alternatives to *kw* and *ks*, and certain digraphs.

After this first step the movement in this country for half a

* The list of experts who, as members of the various committees, worked together to reach a common basis that should be at once rational, scientific, and practical, is given in Appendix I (page 83), and their professional standing may be learned from *Who's Who*. The list ought to impress every intelligent man with the presumptive good sense of their conclusions.

† This symbol *u*, for the vowels heard in *burn* and *but*, is in some publications given the form of a small capital *u*. The original form, however, is the better.

generation appeared to make little progress; * but the heaven was working. With the further development of the science of phonetics, and a consequent significant change in the methods and aims of language study, a need was felt throughout a wider educational circle for a rational scientific alphabet precise enough for elementary instruction in phonetics and simple enough for the widest popular use. The Department of Superintendence of the N. E. A. took the initiative in calling a conference in Boston in 1903, in which representatives from the N. E. A., the American Philological Association, and the Modern Language Association took part.† The conference at once accepted the 1877 alphabet as right in principle and as satisfactory in most of its details, and appointed a Joint Committee from the three associations to prepare a report that should embody the aim of the conference. That aim was "to agree upon and promote the general adoption of the best set of alphabetic symbols to be used in dictionaries and text-books for the accurate denotation of the sounds heard in English speech."

The report of this Joint Committee, adopted after exhaustive study, and published in the fall of 1904, gave a careful review of the details of the problem, and submitted an alphabet for acceptance by the three associations. The revised alphabet was again considered by a committee of the A. P. A. and the M. L. A., and later by a committee of the Department of Superintendence. The final revision by these committees took two directions. The former body changed the value of the sign *a* in order to give the symbol its original significance—the vowel sound in *art*, introduced the ligature *æ* from old English manuscripts to represent the value of *a* heard in *bat*, and substituted *j* for the *y*-sound heard in *you*; they chose the forms *tʃ* and *dʒ* for *ch* as in *church* and *j* as in *judge*, allowing no alternatives; they preferred *jû* to *iû* as the more exact representative of the sound of "long u." These changes were felt to be, in the main, in the direction of greater simplicity and greater historical accuracy. The N. E. A. committee,

* A modification of the alphabet was used in the Funk & Wagnalls *Standard Dictionary*, 1890.

† The American Dialect Society, and the U. S. Geographical Bureau, as well as various scientific and official bodies in England, had already acted upon the lines of the Philological Association's reform, and had adopted similar "scientific" alphabets.

on the other hand, retained the use of *a* as the symbol for the vowel sound in *art*, and *ā* for the vowel of *bat* (in agreement here with international usage), used *sh* and *ch* for the consonants of *she* and *church*, instead of the M. L. and A. P. *ʃ* and *tʃ*, *th* and *th* for the M. L.-A. P. *þ* and *ð*. That is, the N. E. A. changes were in the direction of rendering the new alphabet no more strange to an eye accustomed to English spellings than was absolutely necessary.

These two guiding principles, that the alphabet should be historically and scientifically justified, and that it should be also feasible for popular use, were the principles that the committees kept before themselves. The former necessarily was dominant; the latter, based upon expediency, was subordinate, but was given full consideration.

The following table shows the detailed relations of the three alphabets, that of the Joint Committee, and those of the M. L.-A. P. and the N. E. A. committees on revision.

Only the vowel and the divergent consonant symbols are here given; there is no difference of opinion about the other symbols:

KEY WORD	JOINT COM.	M. L.-A. P.	N. E. A.
art.....	â	â	ā
artistic.....	a	a	a
aisle, find.....	ai	ai	ai
out, thou.....	au	au	au
ask.....	a	â	a
air, care.....	â	æ	ā
at.....	a	æ	a
chew.....	ε, tʃ	tʃ	ch
prey.....	ê	ê	ē
men.....	e	e	e
marine, eve.....	f	f	ī
tin.....	i	i	i
mute.....	iû	jû (iû)	iū
jaw.....	j, dʒ	dʒ	j
sing.....	ŋ	ŋ	ŋ
note.....	ô	ô	ō
poetic.....	o	o	o

KEY WORD	JOINT COM.	M. L.-A. P.	N. E. A.
nor.....	ê	ê	ẽ
not.....	ə	ə	ə
oil.....	oi	oi	oi
ship.....	ʃ	ʃ	sh
thin.....	þ	þ	th
that.....	ð	ð	th
mood.....	û	û	ũ
push.....	u	u	u
urge.....	û	û	ũ
hut.....	ʊ	ʊ	ʊ
yes, you.....	y	j	y
azure.....	ʒ	ʒ	ʒ
about }	ə	ə	ə
over }			
candid }	i	i	i
added }			

In this table, symbols separated by a comma (e. g., *ə*, *tʃ*) are submitted as optional; either may be used. In the second column, *iu* is not an alternative of *jû*, but is intended to represent a slightly different pronunciation. In the case of *ask path pass* etc., the prevailing vowel in the south of England is that of *art*, in the greater part of the United States that of *man*. Some speakers in both countries avoid both sounds, and the intermediate value that they give the vowel is meant to be represented by the new symbol *æ* of the Joint Committee. That symbol may remind some readers of the difference between American and English usage; but it is open to question whether it would not be better for our dictionaries to recognize the prevailing American usage and respell *ask pass path* etc. with *a* as in the case of *at am bat* etc., allowing as an alternative the symbol *ā* (as in English usage). If that were done, the N. E. A. alphabet could drop the symbol *æ*.

The alphabets (M. L.-A. P. and N. E. A.) now offered for approval have undergone repeated scrutiny and most minute consideration by the foremost philological, phonetic, and educational scholarship of the country. It is true that they differ slightly from each other,

and a little more from that adopted by leading English philologists (as, for example, in the great Oxford Dictionary), and from the International Phonetic Alphabet. But the emphasis laid by opponents of the reform upon the lack of uniformity among these various scientific bodies could come only from persons that have not been observant enough to recognize either the essential agreement of all these alphabets upon a common basis, a common method, and a common aim, or the ease with which any one who has an elementary knowledge of phonetics can pass from one to another.

Within eight years the N. E. A., the M. L. A., and the A. P. A. have reached substantial agreement.

(2)

OBJECTIONS TO THE WEBSTER KEY

What led these three associations into a common effort to construct a scientific alphabet and secure its general adoption for phonetic work, including that in dictionaries and school books, was the utter unfitness for such work of the several phonetic keys then more or less used. The basis of those keys, namely, the English alphabet names and English pronunciation values of the letters, was unscientific, unstable, and misleading. On the ground of expediency they might have for a limited *clientèle* and within a limited field some claim to consideration. It may be argued that a child in the mere process of learning to say the alphabet and to read and spell simple English words becomes accustomed to using some of the letters in the phonetic values assigned to them in such keys; that the eye of the child becomes more or less familiar with some combinations of these letters, and he can therefore later learn to use them as phonetic signs with somewhat less effort than he can learn signs wholly new in form. However, even if the like were true of all the characters in, for example, the Webster key, there would still remain a question of the economy of using that key. "If you were going to buy a watch to last you a lifetime, you would not make the choice turn on whether the dealer's shop were five blocks away or six."

A phonetic alphabet should be consistent in its elements, and

precise enough for its purpose. For popular use it must be also simple and easy to learn.

It may be worth while, for those who have not fully considered the matter, to point out why such a key as the Webster is felt to be "unscientific" and unadapted for use in serious phonetic work, even of an elementary kind.

Its defects are the same in kind as those of the conventional spelling. To some extent in German, more so in French, most so in English, conventional spelling is a hindrance in the study of the sounds of these languages. To illustrate by English vowel spellings, a given letter does not stand uniformly for a given sound (*take tack tart talk culpable*); a given sound is not uniformly represented by a given symbol (*ate bait bay gaol gauge great feign they*). Combinations of letters represent not compound but simple sounds, and sometimes one may say that neither of the letters forming the combination is a proper sign for the sound (*laugh meat great head conceive relieve sieve though ought fraught fool*). Other letter-groups stand for combined sounds made up of elements other than those represented by the letters involved (*thou now oil beauty*). Simple characters stand for diphthonged sounds (*mite my mute*).

No phonetician would for a moment think of teaching English sounds by means of English spellings. The inconsistencies and contradictions would utterly confuse and confound the learner.

The like must be said of any key of the Webster kind.

1. The Webster key, even in its latest and best form (it has been considerably altered with each revision of the dictionary), uses a given letter (with varying diacritics, it is true) to represent radically different vowels (*ā* as in *ale*, *ă* as in *at*; *ē* as in *eve*, *ě* as in *met*; *ī* as in *bible*, *ı* as in *bit*). The words here are not rationally paired: the long of the vowel in *at* does not appear in *ale* but in *care*; the long of the vowel in *met* is not that of *meet* but is nearer that of *mate*; the vowel heard in *bit* does not, when lengthened, become the diphthong of *bible*, but approximates the vowel heard in *bean*. If the symbol *a* represents the vowel heard in *ale*, it should not elsewhere represent some other vowel.

2. The Webster key does not represent a given sound uniformly by a given symbol. The first element of the diphthongs heard in

ice and *out* is the vowel *a* of *art*; but in the Webster respellings that vowel is not at all represented in the one diphthong symbol (*ī*), and in the other (*ou*) it is misrepresented as if it were the vowel of *note*.

3. In the Webster key certain double letters stand for simple vowels: *ōō* and *ōō* for the vowels of *pool* and *pull*. The vowels here are approximately the same sound, long in the one word, short in the other (N. E. A. *ū* and *u*, respectively); in neither case is *o* a proper symbol.

4. The Webster key uses simple characters for diphthonged sounds; for example, *ī* for the diphthong in *bible* ("ah-ee" or "ah-i," i e., *ai*). If the word were respelled with the Webster characters for "ah" and "i"—as, to be consistent, it should be—the phonetic form would be *bäib'l*.* Or take Webster *ū* as in *mute*: if this word were respelled consistently, that is, in the Webster characters that represent its phonetic content, the form would be *myōōt*!

5. In English, all vowels in lightly stressed or unstressed syllables have become altered in length or in quality or in both. That is a historical phenomenon of language. The result in present-day English is generally an "obscure" vowel which, whatever its original quality, approaches in quality the vowel of *but*, or, much more rarely, that in *bit*. These sounds are well defined vowels, and have as much independent existence as any other. Only in the most deliberate enunciation, as that of syllable by syllable, a pronunciation that would seem affected in even the most dignified and careful speech, is any of the original vowel heard. We are unacquainted with any scientific alphabet of medium precision which recognizes more than two obscure vowels. For every practical purpose, then, two characters should be sufficient for the "obscure" vowels in English (as the symbols *ə* and *ɪ* in the N. E. A. alphabet). In the Webster key four wholly different devices appear: (1) A dot above the phonetic symbol of the full vowel, as in *prelâte êvent anatōmy formulâte*; (2) a change to an italic form, with breve, as in *infănt recēnt cōntrol circūmstance*;

* Consistency is at times synonymous with honesty. What is to be thought of the man that cites this particular word to stir up the prejudices of his hearer against a consistent phonetic respelling and in favor of his own inconsistent form?

(3) italic form with dot over the letter, as in ábout; (4) a tilde over the letter, as in infêrence. That is, the two "obscure" vowels are represented by ten symbols! In fact, on the Webster basis, there ought to be eleven symbols; one should be added, namely, *ĩ* for the second vowel in *limit*.

When one reflects upon the confusion in the Webster treatment of the "obscure" vowels—upon the use of ten symbols for two sounds, and the difficulty of learning them all; upon the use of some of these symbols now for the one (ə) and now for the other (ɪ) vowel, and the consequent impossibility of *ever* learning to associate unfailingly one specific sound with one specific symbol; and, on the other hand, upon the simple and adequate handling of the matter in the N. E. A. system, namely, two plain symbols for the two vowels—one can not help asking one's self what motives led the experimenter to exclude, as we shall see he did, this part of the two keys from a test supposed to demonstrate which is the better phonetic key, which is "easier to learn, to remember, and to apply."

In explanation, Dr. Whipple (footnote, p. 5) says: "It should also be borne in mind that in this experiment only those Webster symbols are used that correspond in power to the symbols of the Proposed Key. There are other symbols in the Webster Key used to indicate finer distinctions in sound, for which the committee has proposed no corresponding symbols. These other symbols were necessarily disregarded to insure comparable conditions." *

The "other symbols" here referred to were either the symbols for certain sounds in foreign words (Webster ü κ ñ) or those for the obscure vowels. Dr. Whipple's words must refer to the latter. But no one who knows anything of English phonetics and of the pronunciation used by educated Englishmen and Americans of to-day, can explain Dr. Whipple's treatment of the matter except as that of a man not thoroughly instructed in what he was dealing with and imposed upon by conditions surrounding his task. In fact, the first part of the footnote just cited shows that the experimenter was not thoroughly acquainted with his materials. He in-

* In Missouri some years ago the state legislature passed a notorious partisan election law for St. Louis. The St. Louis Democratic "boss" of that time explained that the law was meant to give his party only "a fair *advantage*" in the city elections.

cludes among the Webster symbols used in the tests the Webster ɛ as in *makēr* and the *ng* in *sing*. He says: "In the Proposed Key, apparently the only symbol that can be used for the first of these sounds is 'u,' and the only symbol that can be used for the second is η ." If Dr. Whipple read the N. E. A. key through to its end, he found in it the symbol " ə for *e* in *over*." He probably thinks that the Webster ē is something different, and so would not recognize in the N. E. A. respelling *mēkər* his own, and the current, pronunciation of the word *maker*. He evidently thinks—as do a good many people who have not considered it—that what is called the "obscure" vowel is heard only in careless or rapid speech. But the phoneticians—experts, who have trained themselves to recognize and classify speech-sounds, and who have made observations far more numerous and careful than any intelligent layman, or all of them, could make—these men say that the "obscure" vowel is the normal sound in the usage of the best speakers both English and American. The normal pronunciation (in N. E. A. symbols) of *maker* is *mēkər*, of *infant* is *infənt*, of *anatomy* is *anatəmi*, of *culpable* is *kulpəbl*, of *recent* is *rīsənt*, of *propose* is *prəpōz*, of *preface* is *prɛfɪs*, of *create* is *criēt*, of *senator* is *senɪtər*. Dr. Whipple may think that he does not pronounce these words in this way; that he makes certain finer distinctions in sound which he supposes the Webster key to provide for. But—if he pronounces English as other educated Americans pronounce it—he does not use ten varieties of weakened or obscure vowels requiring transcription in an alphabet of medium precision. The truth is that the Webster key, in its treatment of the "obscure" vowels, evades and smothers the facts; and a reference to its "finer distinctions in sound" has something of the ring of imposition upon the ignorance of the reader.

As for the *ng* in *sing* and the *n* in *bank* (Webster *ng* and η), the difference—if there is a difference—is too minute to be considered in a dictionary for general use; one symbol is sufficient. None of the leading English phoneticians (Sweet, Soames, Jones, Rippmann) recognize more than the one sound, η . For a simple statement of the matter Dr. Whipple may be referred to Professor Rippmann's elementary treatise, "English Sounds; a Book for English Boys and Girls" (Dent, 1911). In §§19, 20 the author

says: "In *long* the two letters stand for the nasal sound only; and we are going to use a special sign for this in future: η , that is, an *n* with the tail of a *g*. In *longer*, *ng* has the value of ηg .

"Sometimes we say η when we write *n*, as in *thank*, *anchor*, *tranquil*."

But to return to noting the inconsistent and therefore "unscientific" features of the Webster key.

6. The Webster key makes an extended and at the same time inconsistent, chaotic, use of diacritic marks.

The use of diacritics in itself would not necessarily make the key unscientific if the marks were used consistently, that is, each always in its one significance. There is, however, a question as to the advantage of using diverse diacritic marks rather than diverse letter forms when the aim is to distinguish the *qualities* of sounds.

The diacritic may very well denote *length*. In the words *art note* there are vowels heard also in the first syllables of *artistic poetic* respectively, but in the one case the vowels in question are longer than in the other. The macron put above the symbol will easily and clearly distinguish a long vowel. The symbol for the short vowel need not be marked. The N. E. A. alphabet, for example, distinguishes these four vowels with a minimum use of diacritics: $\bar{a}$ a , $\bar{o}$ o .

But the question whether it is better to use many or few diacritics, in many or few senses, ought to be satisfactorily answered by the fact that competent teachers who have tried both declare against any further use of such marks than is absolutely necessary. The chief phoneticians of the world are explicit in their statements. At an annual meeting of the German Modern Language Association, Zurich, May, 1910, W. Viëtor discussed the need of a consistent phonetic alphabet for modern language schoolbooks and dictionaries. He declared (1) that such an alphabet is most earnestly to be desired; (2) that it should be a genuine phonetic alphabet, *not one made with diacritic marks*; (3) that the alphabet of the *Association Phonétique Internationale* best answered the demand.* Sweet, the leading English phonetic authority, in his recent book, "The Sounds of English" (Oxford, 1908), says (§313): "The most objectionable

* *Die Neueren Sprachen*, xviii, 549 (1910-11).

class of letters in a broad alphabet are diacritical ones." † Otto Jespersen, of Copenhagen, one of the keenest of phoneticians, in his "Phonetische Grundfragen" (Leipzig, 1904), §25, p. 19, says that to mark shades of sound variation for which there is no symbol in the conventional alphabet, the nearest recourse is to diacritic marks. These to a degree have long been in use in certain languages, the macron and the breve, for example, in the work of old Roman grammarians and metrists as marks of quantity. It is no wonder, therefore, that many phoneticians have taken refuge in such means, and have tried to make systematic use of them—some placing diacritics above the letters, some below, and some both above and below. But both principles lead to an impracticable alphabet. Lepsius in his so-called Standard Alphabet (1855) carried the practice to an extreme. "Since his time it is only dilettantists and beginners who, incapable of profiting by the warning of past experience, think that they can construct a satisfactory phonetic alphabet by applying an array of diacritic marks over and under the letters of the Latin alphabet." The International Phonetic Association, whose headquarters are in France, explicitly avoids the use of diacritics wherever possible. All of the recent steps toward a universal scientific alphabet in England or in this country—the alphabet of the Oxford Dictionary, that of various scientific bodies in England and America, that of the American Philological Association (1877) revised into the A. P.-M. L. and the N. E. A. alphabets now under discussion—make use of a minimum of diacritic marks.

The opinions of these expert phoneticians, and the practice of the leading philologists, language associations and scientific bodies, furnish satisfactory guidance.

Now, it must be noticed that the 1909 Webster key not only uses a multitude of diacritic marks, but uses them inconsistently.

Leaving out those signs in the Webster key that are needed for certain foreign words, that is, counting those that furnish an English phonetic alphabet equivalent to the N. E. A. key, there are found in the Webster six vowel characters with the macron (ā ē ī ō ōō ū), four with the macron and a dot (â ê ô û), ten with the breve (ă ă ẽ ě ĭ ȩ ȯ ȯō ŭ ŭ), one with breve and a

† By "broad alphabet" Sweet means one of medium precision, for general or national use; an exact alphabet specifically for phoneticians he calls "narrow."

dot—if one may trust one's unaided sight (ö as in *söft döğ göd*),—three with circumflex (â ô û), one with two dots above (ä), two with one dot above (à á), one with tilde (ẽ).

Here are twenty-eight vowel signs, some of them with two diacritics, all the rest with one, to represent vowel sounds that phoneticians recognize as about twenty-one in number! And there are two more, *oi* and *ou*, for two of the English diphthongs (those in *oil* and *now*). Thus we find thirty Webster symbols for twenty-three vowels.

The N. E. A. key, by way of contrast, serves the same purposes with twenty-three signs, just one for each sound: ā a ai au ā a ē e ī i iu ō o ɵ ē ei ū u ŭ u ə i. Only eight of them are marked with a diacritic, the macron. The diphthong-signs are consistently formed of their proper elements, so that they do not have to be learned for and by themselves. That is, one has to learn the form and phonetic value of only eleven characters (a a a e i o ɵ u u ə i). The macron, when applied, is always to be interpreted as a sign of length; it does not connote or accompany a significant change of quality. A scheme of symbols for English vowels could not be simpler.

But set to work on the Webster diacritics. What does this or that diacritic mean? Length? or quality? or both?

Compare the words *care* and *can* (Webster respelling, *kâr kăn*). The quality of the vowels is, at least in ordinary American speech, the same. The vowel in *care* is long, in *can* is short. Is one, accordingly, to understand the circumflex as the sign of length, the breve of shortness? Then how is one to interpret the Webster symbols for the vowels in *old* and *all*, namely, ō and ô? The difference here is one of quality, not of length. The only conclusion that a rational mind can reach is that in â the circumflex is a sign of length, and in ô is a sign of quality, which is irrational.

Again, the Webster symbols ōō for the vowel in *food* and ɵɵ for that in *foot*, represent sounds (not properly indicated by the symbol o) that in an alphabet of medium precision may be regarded as one vowel. The macron and the breve are here evidently signs of quantity; but since only one of them is needed, it is foolish

to use both. Compare these symbols with those used for the vowels of *ale* and *at*, namely, $\bar{a}$ and $\breve{a}$. Does this second pair of symbols, opposing macron to breve, represent a common vowel in the two words, a vowel long in the word *ale* and short in the word *at*? This can not be, because the vowel heard in *at* does not, when lengthened, become the vowel heard in *ale*. One can not apply what one learns from the symbols $\bar{o}$ $\breve{o}$ to the interpretation of the symbols $\bar{a}$ $\breve{a}$, however spontaneously a simple mind would assume that a pair of symbols distinguished from each other by certain diacritic marks must have the same relation to each other as obtains in another pair differentiated in the same way. Two cards marked each with a black spot are aces; but of two marked each with a red spot, one is an ace, and one is something else!

The learner fares no better who tries to reason from breve to macron in the Webster symbols $\bar{i}$ and $\breve{i}$; for the first stands for a simple vowel, that heard in *ill*, and the second for a diphthong whose main element is quite another vowel—namely, the diphthong heard in *ice* (ai).

The Webster uses of diacritic marks are, in fact, *un-reasonable*. Any attempt to classify the diacritics according to their uses will end with one's defying the world to do it. One must fix them in mind by sheer force of memory.

The attempt to learn the English vowel sounds by means of a phonetic key so confused and contradictory must bewilder, even stupefy, a child's mind; and the teacher must bear a useless burden, perhaps not realizing it, who tries to induct children into the science of speech-sounds, with the help of such a system of "ocular phonetics run mad."

As for the phoneticians, they will none of it!

There is no living phonetician who can regard a key of the Webster kind with anything but impatience. The Webster key, in comparison with such a key as the N. E. A., might be likened to the English system of pounds and shillings, in comparison with the American system of dollars and cents—except that this would be doing an injustice to the English system.

It is because of this multitude of inconsistencies and contradictions in the Webster key, and in every key, which, like it, starts from the basis of English alphabetic and pronunciation values of the

vowels, that phoneticians and philologists and progressive teachers of the living languages (whether the mother tongue or a foreign speech) reject such a key *in toto*. As a guide to pronunciation, its only usable capacity, it is of questionable merit even for the uninstructed layman, for whom its leaning upon pronunciation values might be felt, at first thought, to be an advantage. In all other uses for which a phonetic alphabet is needed, it is worse than useless; it is execrable.

(3)

USES OF A SCIENTIFIC ALPHABET

A simple, rational, and scientific alphabet is needed, as a means—

(a) For teaching phonetics in schools of all grades: there should be elementary instruction for children learning to read, somewhat more thorough work for pupils taking up the study of a foreign language, and extended and thorough practice for language teachers.

(b) For indicating pronunciation, in schoolbooks, dictionaries of the native and foreign languages, and all handbooks and general works of reference.

The purposes of a phonetic alphabet are here named in inverse order of their importance as present public opinion would regard them; for there are at present among us few learners of English phonetics, relatively little study of the sounds that form English speech and little training in the correct and intelligent production of those sounds. But there is a vast army of users. From their point of view the main function of a phonetic alphabet is to indicate the pronunciation of words assembled in English dictionaries, encyclopedias, atlases, handbooks, and all popular scientific treatises.

For this purpose such an alphabet should be "easy to learn, easy to read, and easy to remember." As a matter of fact, the last requirement is, for the average uninstructed layman, not essential. He does not attempt to remember any key, but refers, when in doubt, to the top or bottom of the page, where he finds it. His chief need is that the symbols of the key be clear, explicit, precise.

That established English spellings are quite unfit to indicate pronunciation, is universally recognized. Most dictionaries, and some encyclopedias, respell the words, and in many schoolbooks and handbooks words new to the reader are treated in like manner—a

more or less phonetic respelling is set alongside the conventional form. Manifestly, it would be of very great advantage if all these books used a common phonetic alphabet, if there were a *national scientific* alphabet.

It will be worth while to review here some details of the problem.*

It is generally agreed that a phonetic alphabet intended for wide use (1) should use one sign for one sound, (2) should, as far as possible, employ the letter forms already familiar, (3) should add few new forms, (4) should employ few diacritic signs, (5) should not mingle forms of differing styles in a way unusual in ordinary print (for example, italic with roman, capitals with small letters), (6) should design the necessary new symbols in harmony with existing letters. That is, the respelled word should offer as little as possible that is strange or startling to the eye.

It would be well, also, to adopt an alphabet constructed in harmony with international usage. Nations to-day are too close to one another, intercourse between them is too constant and intimate, for each to go its own way as of old. The relation that a phonetic alphabet adopted in one country should have to those adopted in other countries, is briefly stated by Sweet, in §§§ and 308 of his "Sounds of English":

"In dealing with the sounds of English it becomes necessary to adopt a phonetic notation. It is now generally agreed that the best way of constructing such a notation is to give the letters of the Roman alphabet the sounds they had in the later Latin pronunciation, with, of course, such modifications as seem to be improvements or otherwise desirable, supplementing the defects of the Roman alphabet by adding new letters when required. This is the 'Romic' or international basis. . . .

"Whatever alphabet is adopted, it must be capable of modification so as to supply the want of (1) an international scientific 'narrow' notation, in which all possible shades of sound can be expressed with minute accuracy by symbols of fixed value, and (2) an indefinite number of national 'wide' notations, each of which selects the minimum number of simplest letters required to express the prac-

* See the brief but complete presentation of the matter in Section II, pp. 4-17 of the "Report of a Joint Committee on a Phonetic English Alphabet" (Publishers' Printing Co., New York, 1904)—the Report referred to on page 7 above.

tically necessary sound-distinctions of the language in question, ignoring those that are superfluous, so that all the national systems appear as modifications of a common basis, each diverging from it only so far as is made necessary by considerations of simplicity and ease of printing and writing both in long and short hand."

That is exactly what is attempted in the N. E. A. alphabet—to effect such a modification of the international alphabet (of a thing, it is true, that does not yet have absolute existence, but which nevertheless is already fixed in all but its minor details), as shall adapt it to national use in this country. That the committee succeeded in making an alphabet that is in substantial harmony with international usage, every American linguistic scholar will recognize. That in itself it is a good phonetic alphabet is evident upon consideration of what characteristics such an alphabet should have.

The symbols used in respelling to indicate pronunciation should, above all, indicate the nature, or *quality*, of sounds. Less important, and applying mainly to vowel sounds, is the indication of length or *quantity*. A third essential thing is the indication of syllable stress or *accent*; but this last duty does not rest upon the letters of the alphabet.

The manner of marking the quantity or length of vowel sounds is a matter for consideration. Shall quantity be indicated by the form of the letter, or by a diacritic mark? Now, expert opinion and practice are unanimously against a general use of diacritics. Quantity, however, is a thing affecting in the same way a whole series of vowels. If it is indicated uniformly by a given diacritic mark that has no other significance, one has to learn the meaning of this mark only once for all. And since in English fewer long vowels than short need notation, to employ a plain mark as the long-vowel symbol involves a minimum use of the diacritic.* What diacritic should be chosen is to be decided by considerations of clearness to the eye, and durability in the printer's type. On these grounds the macron is the best.

* In the construction of the N. E. A. and the M. L.-A. P. alphabets, as of that of the Joint Committee (given on pp. 8f.), the committees thought it better, in an alphabet of medium precision, to disregard the slightly diphthongal character of the long vowels (N. E. A.) *ê î ô û* heard to some extent in the United States, and generally in South England.

It is when one comes to choose the means of indicating the qualities of vowel sounds, for consonants give little trouble, that difficulty is met and controversy arises. The English vowel scheme appears, in its English dress, to be a monstrous thing, without form and void of meaning. There is no head or foot, end or side, up or down; absolutely no handle by which to take hold of it, nor point of view from which one can conceive of its having a form. One must, therefore, take the familiar vowel symbols, "a e i o u," assign to each a phonetic value, and make additional symbols (either by adding diacritics to some of these letters or else by inventing new forms) until there are enough letters to have one for each of the elemental vowel sounds in the language.

For the purposes of a phonetic alphabet of medium precision, phoneticians recognize in English eleven vowels requiring transcription, namely, those of *art ask at met bit note not pool but* (ov)er (add)ed. Indeed, the vowel of *ask* need not be included; most of us pronounce it as we pronounce the vowel of *at*. The intermediate vowel, as far as present usage is concerned, is an invention of dictionary makers. We need, then, five (six, with **a**) new vowel symbols.

If we listen to what the experts say (pp. 15f. above), we shall not use diacritic marks to make them; for above each of the original letters we must at times put a diacritic sign of length, and to superimpose a second diacritic of quality would quadruple the ground of objection to diacritics. We could make the one diacritic indicate at the same time both length and quality; in which case we must have three sets of diacritics, to mark a change (1) of length alone, (2) of quality alone, (3) of length and quality together. Which, again, multiplies the diacritic difficulty.

Unquestionably, the best procedure is to make five or six new vowel symbols, as was done for the N. E. A. alphabet. Then each symbol, in its unmarked form, has a recognized phonetic value, and never—whatever diacritic cap or tail is attached to it—stands for a radically different vowel. Horses may be of different colors, shapes and sizes, but you never mistake a horse for a cow. Whether the N. E. A. new vowel signs are satisfactory in design, is submitted to the intelligence and sense of harmony of the public.

Diphthongs should of course be represented by the letters de-

noting the simple sounds that combine to form them. No other way can be defended by logic of the schools or by common sense. One should be consistent. If one, for example, chose to use *aw* as the phonetic symbol for the first vowel in *awful*, and *ie* for the vowel in *sieve*, then one must, to be consistent, respell the word *boy* as *bawie* ; for the diphthong in *boy* is a union of those two vowels.

Being provided with ten or eleven simple vowel signs, then, and the macron as a sign of length, we can represent all the vowels in English speech that the ordinary uses of an alphabet call for. And to translate into sound the twenty-three symbols thus made, we need to know the form and significance of just twelve things, namely, of eleven letters and one diacritic.

By way of parenthesis, it may again be remarked that with the Webster key—since neither letters nor diacritics are uniform in value—not only each letter but also each combination of letters or of letter and diacritic must be learned by and for itself; in the which learning one's instinct for law and order and reason must first be bludgeoned into unconsciousness.

One more question must be decided before our phonetic alphabet can be constructed: how shall we distribute the eleven phonetic values among the eleven signs? Phoneticians, philologists, our teachers of foreign languages, our government scientific bodies, and our learned associations, have chosen to use the vowel signs in their Latin values. To do so brings the notation into harmony with phonetic science, which, being a science, is international. It makes the notation a help instead of a hindrance in the study of foreign languages. It opens the literature of phonetics to teachers of English. It brings order and consistency into the alphabet, a consummation impossible when one symbol, as *i*, is used to denote such widely separated sounds as the vowel of *bit* (*i*) and the diphthong of *bite* (*ai*). There is no phonetic kinship between the sounds; nor is there between the vowel of *mate* and the vowel of *mar* or *mat*, nor between the vowel of *meet* and the vowel of *met*.

To use the letters *a e i o u* in their European or Latin values creates no difficulty for any one who knows even a little or wishes to learn a little about one of the foreign languages. On the contrary, it lightens materially the learner's task. But for one who knows only English, it looks like a different matter. There is the

heart of the difficulty, the gist of the opposition among laymen to the N. E. A. or any similar alphabet—so far as that opposition is not inspired by commercial influences.*

To any one to whom the alphabet names are so ingrained that he can not separate *ā* from *ale*, *ē* from *ee*, *ī* from *ice*, but *must* associate these letters with the sounds heard in the respective words, there comes a shock when he is for the first time told to write *ē* for the sound in *ale*, *ī* for the sound in *ee*, and *ai* for the sound in *ice*; and it will take him a little time to regain his balance, to get his bearings. An alphabet like the N. E. A. is, however, so much more simple and consistent in its elements, and in their application, that the mastery of it and its uses must for a rational mind be easier to attain than equal efficiency with a key more intricate, and inconsistent in many of its elements. There have been no investigations or experiments that show the contrary.

The recognition of specific difficulty in learning several of the N. E. A. symbols applies only to the cases of persons to whom it has become a habit to associate with certain letters the phonetic value given by their alphabet names; and the difficulty itself is only temporary.

If, on the other hand, an elementary study of English sounds were introduced where it ought to come, namely, accompanying the child's first attempts to read, and if a consistent phonetic alphabet were used in the instruction, the child would have less difficulty in learning the rational key, symbol by symbol, than in learning the Webster, would have fewer symbols to learn, would find in the process of learning a means of developing instead of stunting its reasoning powers, would find pleasure in gratifying its instinct for order and system, would more easily attain a correct and confident pronunciation.

* If the plea of the opponents of the N. E. A. alphabet to retain "our alphabet as it has been handed down to us" is felt to have any weight, one should consider that present pronunciations of the alphabet names, as of other words, are quite modern. For the greater part of their history the vowel signs *a e i o u* have had in English their continental values; and the *names* of these letters, until comparatively recent times, were simply the vowel sounds heard respectively in the words *art they ere note rule*. There is nothing sacred or immutable in our present alphabet-names; they could be changed without difficulty in one generation, and the change would be little more than a restoration of earlier usage.

All these results have been realized in teaching modern foreign languages in Germany, France, Denmark, and (more recently) in England. That the pupil must first learn accurately the sounds of the language, their physiological nature and relations, and must train his vocal organs to make them, is one of the cardinal principles of the "new method" of language teaching. In this elementary instruction an ever increasing number of teachers use at the beginning of the work a phonetic alphabet only. After the pupil, reading from a phonetic transcript, has learned thoroughly the sounds of the language, then he is gradually introduced to the conventional spelling. This principle of the reform, namely, that emphasis should be laid upon correct pronunciation as the first thing to be attained in the study of a foreign language, and upon phonetic training as the means of attaining it, teachers as well of the native tongue in those countries are beginning to adopt and put into practice.

The extent, methods, significance and results of the "reform" in modern language teaching within the last generation should be considered in any decision upon a matter of such basic importance as the construction of a phonetic alphabet. Of that reform a leading English educational authority, J. J. Findlay, Professor of Education in Manchester University, said: "Quite deliberately the present writer ventures to assert that the 'reform' in modern language teaching now in progress is one of the most noteworthy events in the sphere of Teaching since the Renaissance, surpassing in importance even the results of introducing Science into the Schools."

The history and principles of the reform one may review in numerous educational monographs, and in articles in educational journals.*

The first noteworthy public enunciation of the reform ideas was that of Viëtor in his pamphlet of 1882, "Der Sprachunterricht muss umkehren!" In opposition to the grammatic-philological method then in full vogue, Viëtor advanced the ideas championed before by

* See especially the German publications like M. Finger's "Der fremdsprachliche Unterricht" (Leipzig, 1907), and Viëtor's "Die Methodik des neusprachlichen Unterrichts" (Leipzig, 1902); or Jespersen's excellent "How to Teach a Foreign Language" (English edition, Macmillan Co., N. Y., 1904). For the most recent account in English of the new method, see F. B. Kirkman: "The Teaching of Foreign Languages; Principles and Methods" (Clive, 1909).

such educators as Ratichius, Comenius, and Pestalozzi. His pamphlet "demanded thoroughness of pronunciation, a more intensive study of reading, and inductive study of grammar based upon the reading. Above all, not the dead letter but the spoken word was to be put into the foreground of modern language teaching." *

Of course some reformers went too far. They were accused of putting a smattering of conversational attainment in the place of solid mental training. But the essential principles of the movement were more seriously developed and built upon; and the progress of the reform became so unmistakable and significant that it began (1901) to be reflected in slow-moving German officialdom.

German official *Lehrpläne* (Outlines of Instruction) in foreign languages in secondary schools, 1882, named correctness of pronunciation as the first requisite, but expressed doubt of attaining it. The Outlines for 1891, however, insisted upon it. The study of phonetics had in the meantime been introduced and applied to modern language instruction, and found to be a means of teaching right pronunciation. German officialdom recognized the results but not the means; for the official Outlines of 1891 forbade the use of phonetic script. (One should keep in mind that no satisfactory phonetic alphabet had then been agreed upon. In fact, at this time, Paul Passy in France was perfecting his alphabet, now known as the International Phonetic Alphabet, and used by the leading modern language teachers in Germany, as in practically the rest of Europe, including England.) Finally in 1901, *Lehrpläne* for boys' upper grammar schools (*für die höheren Knabenschulen*) no longer forbade phonetic instruction and the use of phonetic script in beginning classes in foreign language work.† This official recognition of the usefulness of a phonetic alphabet is significant.

The introduction into English schools of the continental "reform" (including the use of phonetic script in beginning classes) is now taking place. The platform of progressive English language teachers is, in brief: Phonetics is "the *science* of speech-sounds and the *art* of pronunciation" (*Enc. Brit.*). "The advantages of beginning a foreign language in a phonetic notation are many and

* Krause: "The Teaching of Modern Languages in German Secondary Schools," *Monatshefte für d. Sprache u. Pädagogik*, X, 6 and 8.

† Finger, p. 31.

obvious. A learner who has once mastered the notation and learned to pronounce the sounds the letters stand for, is able to read off at once any text that is presented to him without doubt or hesitation, and without having to burden his memory with rules of pronunciation and spelling. . . . If the learner begins with the phonetic notation, and uses it exclusively till he has thoroughly mastered the spoken language, he will then be able to learn the ordinary spelling without fear of confusion, and quicker than he would otherwise have done."

The experience of teachers who have adopted this platform may be given in a few representative statements: *

"Every foreign language teacher finds that one of the most serious of the difficulties which confront him at the beginning of his teaching is the fact that he has to present to his pupils and make them acquire correctly a certain number of sounds. . . . The quickest and surest way is by a systematic course of phonetics and regular practice in phonetic drill. . . . Once the phonetic alphabet is mastered,—this is not nearly so difficult as some think,—a regular sound drill of about five to ten minutes at the beginning of each lesson for about a week will work wonders. . . . [A child finds] satisfaction in pinning sound down to a symbol that can represent only one thing. . . . [It] satisfies a child's sense of proportion and fitness of things. . . . Does the use of phonetics in writing spoil the pupil's ordinary spelling? . . . It has invariably been my experience that when children have been taught phonetics from the beginning, they spell French words far more correctly than those who come to me with no phonetic training at all."—V. Partington, in *Mod. Lang. Teaching*, ii. (1905-6), 40-44.

"True it is that the earlier it [phonetics] is made use of, the better for teacher and for taught. . . . No one who has tried the two methods, that of relying upon the pupil's memory, and that of giving him the phonetic script to help him remember, would care to give up the use of the script."—H. W. Atkinson, Rossall School, in *Mod. Lang. Quarterly*, iii., 54, 56.

"Phonetics are used. . . . The idea that imitation is sufficient to teach the sounds of a foreign language is dying out."—Fr. Dörr, in *Mod. Lang. Teaching*, ii., 232.

* These are all from leading English modern language teachers, and school inspectors—*practical schoolmen*.

"A beginner may hear a new sound a thousand times without reproducing it rightly. This is the 'imitation fallacy,' to suppose that mere hearing is sufficient. There must be knowledge and conscious effort. . . . Of all the classes I visited the pronunciation was worst in those held by foreigners teaching their own language to English children. . . . A beginner should always hear and speak before he attempts to read and write."—E. R. Edwards, *Mod. Lang. Quarterly*, vii., 118.

"At first we found it extremely difficult to combine the elements of good reading—articulation, accent, and rhythm. Our energies were almost entirely spent, in the lowest classes of all, on articulation, which, with the complexities of French spelling, is a serious difficulty to beginners of nine; so that when we came to deal with accent and rhythm, bad habits had already been formed. It became evident that all three must be combined from the very first. The solution of the difficulty lay in the use of phonetic script in the initial stage. We introduced that of the *Association phonétique internationale* last January, and we have every reason to be satisfied with the result. It reduces to a minimum the difficulties of articulation. It trains the ear and the faculty of attention to a degree which, of itself, would give it a great educational value. . . . The stage of transition to ordinary spelling offers no difficulties whatever, if only it be carried out gradually and methodically. . . . Last, but not least, the use of phonetics keeps the teacher up to the mark in the matter of pronunciation, and helps him to correct his own defects." . . . "Unless the alphabet used is phonetic there is likely to be confusion just at the time when clear impressions and associations are all-important. In short, some sort of phonetic alphabet is the best 'mistake preventor' in the matter of pronunciation. . . . The one point I want to emphasize is that the first spelling used should be phonetic."—L. von Glehn, Merchant Taylors' School, in *Mod. Lang. Teaching*, v., 46, 154.

So much for the elementary work in French and German as done in English secondary schools. Leading foreign language teachers in Europe and Great Britain agree in recognizing the *necessity* of basing the earliest stages of work in a foreign language upon thorough instruction and training in the elementary sounds of that language, and the great help that may be derived from the

use of a phonetic transcript. Jespersen's "How to Teach a Foreign Language," Chapter X (pp. 142-173), is an adequate presentation of the matter.

What use is made or is to be made of phonetics in the elementary teaching of English?

That the method, now widely used and found to be so efficient with pupils beginning a foreign language, would bring about a like advance in the teaching of the mother-tongue, is felt by a very large number of linguistic scholars.* The consensus of opinion of the International Phonetic Association—a society numbering about one thousand members distributed throughout the world, drawn from the ranks of the foremost teachers and scholars—is expressed in "The Aims and Principles" of the Association (1904): "Phonetic writing can also be used with great profit in elementary school work for teaching to read the mother-tongue. Learning to read by the usual methods is at best a long and dreary task; but where phonetic texts are used it becomes short and easy. When once a child reads phonetic texts fluently, learning to read the common spelling is a mere trifle. This is a most important, though hitherto little known application of phonetic writing, which may yet revolutionize the systems of education all over the civilized world."

Sweet long ago wrote: "If our present wretched system of studying modern languages is ever to be reformed, it must be on the basis of preliminary training in general phonetics, which at the same time will lay the foundation for a thoroughly practical study of the pronunciation and elocution of our own language—subjects which are totally ignored in our present scheme of education" (Preface to "Handbook of Phonetics," 1876). Later he said: "Phonetics, of course, should be begun in the nursery. The time will come when ignorance of phonetics will be held to disqualify a nurse as much as any other form of incapacity." In the same book from which the last sentence is cited, the author further says: "The reading-books in the native language should at first be mainly in simple prose, with only occasional pieces of simple poetry. They would, of

*The new method applied to the teaching of English may be seen in part in the books of H. C. Wyld, "The Historical Study of the Mother Tongue" (1906), "The Place of the Mother Tongue in National Education" (1906), "The Teaching of Reading in Training Colleges" (1908), published by Murray, London.

course, be entirely in phonetic spelling on a Broad Romie basis, and with accurate marking of stress and intonation" (p. 245 of "The Practical Study of Languages," Dent, 1899).

Sweet's words are beginning to bear fruit.

W. Campbell Brown, in *Mod. Lang. Quarterly*, iii, 46, writes: "The use of a phonetic system by the teacher to organize the teaching of pronunciation is a comparatively simple matter. . . . Should phonetics be only and for the first time applied to the learning of foreign tongues? We should answer most decidedly in the negative.

1. Our own language has not a sufficiently fixed standard of pronunciation. The use of a *Lauttafel* [phonetic chart] might be made of great service in improving the pronunciation of the native tongue.
2. Phonetic signs and the use of the *Lauttafel* are much more rapidly learned through the medium of English than of a foreign language.
3. There is no reason why it should be the duty of the foreign language teacher to teach pupils the use of their organs of speech and the classification thereby of the different sounds of speech."

It is only by the help of phonetics, "the *art* of pronunciation," that it is possible to deal effectively with vulgarisms and provincialisms of pronunciation and secure uniformity of speech. On careful training of the ear and the organs of speech in the early years of the child's school life depends the acquirement of a clean and correct pronunciation, the overcoming of slovenly habits of speech. If bad habits are not got rid of before the child reaches the late grammar grades, he will in most cases be by that time confirmed in them.

Such training is in itself an educational influence now beginning to be recognized. Pronunciation and reading are the first subjects the child studies. It is important that this earliest work should appeal to and satisfy the child's instinct for consistency. Contradictions in the material put before the child do more harm than to a more mature mind. Let a child feel from the beginning that there is system and reason in what he is doing; then his mind will take hold more readily, grow sensibly into a more efficient thinking machine. This fact explains the success of the experiments by Féline in France, Miss Soames in England, and Spieser in Germany, in teaching children to read first in a phonetic script, and only later in the conventional spelling. It is found that children taught in this way for two years have then no difficulty whatever in passing to ordinary spelling.

They make better readers, and better spellers, than children taught from the beginning with conventional spelling alone.*

In our own country like experiments were made as long ago as 1866-70, in the public schools of St. Louis, under the administration of W. T. Harris, then Superintendent of Schools of that city. Dr. Harris's account of the experiments may be found in his annual reports.

In 1866-67 a phonetic primer, printed in the phonetic alphabet constructed by Dr. Edwin Leigh, was used in the Seventh Grade of the Clay School (of which Harris was then Principal). Its introduction "proved to be productive of the most satisfactory results. The class that finished it made very rapid progress in learning to spell in the common orthography after they were transferred to the ordinary type in the First Reader. But the best of all was the demonstration that the imperfections of articulation and the provincialisms of pronunciation current here can be completely eradicated by that thorough drill that is rendered necessary in teaching the Phonetic Primer. Besides, it was shown that all this can be done in less than the time required for completing the same textbook in the ordinary type!" (*Thirteenth Annual Report*, 1867, p. 56.)

The St. Louis Board of Education adopted the innovation for the ensuing year, in the Seventh Grade, throughout the city. In addition to the Primer, a Phonetic First Reader was introduced. The results Dr. Harris narrated and considered at length in his report for 1869 (*Fifteenth Annual Report*, pp. 95-98). He notes that "the phonetic system is found to produce the best spellers," and he gives a "summary of the advantages of the phonetic system, as introductory to the art of reading: I. Gain in time—A given standard of good reading can be reached in about one-half the time. This has been thoroughly tested. II. Distinct articulation—clear-cut words, every element brought out in its purity—is secured. III. The logical inconsistency of the ordinary alphabet makes the old system a very injurious discipline for the young mind. The earliest studies

* Such a result is to be expected from properly conducted experiments with the mother-tongue; for the method, when applied to *beginning* work in the mother-tongue, has to meet conditions essentially similar to those that surround the beginning work in a foreign language. In the latter, its success is established. See Professor Geddes' statement in *Die Neueren Sprachen*, xiii, 361.

should be the most logical and consistent. IV. The most important feature of the phonetic system is the substitution of the analytic drill, during the first year of training, for the loose word-method in vogue. . . . Pupils who are taught to read phonetically make better arithmetic and grammar scholars, and are more wideawake and attentive, have finer discrimination—in short, are more distinguished in those traits of mind that flow from analytic training."

Again in the *Sixteenth Annual Report* (1870), p. 165, the Superintendent records gratifying results: "Gain in time, distinct articulation, better spelling—these are its merits. . . . The gain in time is nearly one-half, and the improvement in quality fully as great." By reference to the Schedules of Studies in the reports for 1866 and 1870, one may find that in 1866 pupils began the Second Reader in the third quarter of the *Sixth* Grade, in 1870 in the third quarter of the *Seventh* Grade, a saving of one year's time in less than two years' work as ordinarily done.

Finally, in the *Seventeenth Annual Report* (1871), p. 133, Dr. Harris reviews the results of the four years' use of Phonetic Primer and Phonetic First Reader, and again states his conviction that the gains promised by earlier stages of his experiment are remarkable and permanent.

These early experiments were made with an alphabet much less simple and clear than that now proposed by the N. E. A. committee. The primary teachers of that time (1866-70) had no phonetic training—a training now possible through the development of the science of phonetics. If the experiment were now tried, with the present understanding of the problem, on the scale that was possible to Dr. Harris, the results would inevitably overwhelm any opposition to the method, and to the means employed in carrying it out. Dr. Harris's measure of success, however, substantiates what modern language teachers are to-day finding out—the greater effectiveness of the "new method," with its reliance upon early and thorough training in phonetics and its employment of a scientific alphabet as an aid to the child's first steps in language.

More recent primary English instruction based on phonetics is referred to in *Modern Language Teaching*, ii, 232: "I have seen excellent results obtained from judicious and systematic use of pho-

netics in teaching children to speak and read their mother-tongue by Miss Nellie Dale, of Wimbledon."

Miss Dale's work is based upon phonetics and involves thorough training of the children in speech-sounds. It is true she does not use a phonetic alphabet. She substitutes the device of printing letters in varying colors—vowel signs in red, voiced-consonant signs in black, voiceless in blue, silent in yellow. With what Professor Rippmann characterizes as nothing short of genius, she adapts her method to the child mind with excellent results. Nevertheless, even with her method, the inconsistencies of conventional spelling flare up in the face of the child, and must be overcome by memory alone; and Miss Dale's genius appears in the interesting devices by which she assists the memory. In the hands of teachers at large, a still more consistent means of representing sounds would lighten the task and relieve the child of part of the burden that her system in a measure still imposes upon the memory.

In the kindergarten and primary, her device of colored letters and appropriate pictures would greatly increase the pleasure and interest of the child, whatever alphabet is used. It can not, however, have the full *educational* value of a strictly scientific and consistent scheme of symbols.

A really scientific alphabet is needed from the beginning of the child's work with speech-sounds.

The opponents of the N. E. A. and the M. L.-A. P. alphabets seem not to realize that the proposals of these educators and scholars are in line with the general advance of linguistic science in the last two-thirds of the nineteenth century. That movement, of late quickened and directed by the special development of the science of phonetics, and the application of that science to language teaching, is older and broader than the modern language "reform." It affects all language work. The reform of Latin pronunciation in America and England was one of its minor currents, and had a history that the present reform in modern language teaching seems to be repeating.

It is interesting now to review the prolonged controversy over the introduction of the Roman pronunciation of Latin into American and English schools. It offers many parallels to the present struggle over alphabets.

Let us keep to the English pronunciation of Latin, said they of a

generation ago; it will help our students in their pronunciation and their use of the mother-tongue. The new-fangled way will be harder to learn, will put another bar in a stile already too high for many of our pupils in Latin to climb over. The "innovation" will throw additional burdens upon teachers of Latin, who must now not only re-instruct themselves in a strange and difficult subject, but must take up the task of teaching the subject to unwilling schoolboys. The English pronunciation of Latin is for us at once the "natural," the logical, and the helpful. We have already a mass of phrases in law, medicine and the arts, which we pronounce in the English way. Let us rally to the defense of our established, tried, and familiar ways against a change that threatens to subvert them. The reformers are themselves not agreed; they have only uncertainty and confusion to offer us. The ruin, moreover, will involve more than our Latin and our English scholarship. Our language itself is threatened! There is a foe in hiding. Spelling reform is on foot; and it and the reform of Latin pronunciation are allies!

That this is no exaggerated picture of the Latin pronunciation controversy of thirty years ago, and later than that in England, a glance into the literature of the struggle will show. A few specimen passages follow:

"The whole question is whether it will tend to promote the study of Latin if we put another bar in the stile already too high for most boys in the form of a foreign pronunciation, to which they are unwilling to lend their tongues, and which deprives them to a great extent of the help in suggestion and to the memory of like sounding English words, derivative from the Latin."—A *London Times* correspondent, April 6, 1907.

"But of this [i. e., of the value of using the Roman pronunciation in any serious study of Latin philology] boys can not easily be convinced; and accordingly they did not care for a change that seemed to them merely troublesome."—Headmaster of Westminster (1879).

"I think 'reformed Latin pronunciation' a mere waste of time, and, if done on a fictitious, professor-made plan, absurd. . . . But *cui bono* 'Reform'? Not for any practical end."—Headmaster of Rugby (1876).

"Philological skill is not dependent upon the accidents of utterance."—Principal of Phillips Academy, Andover (1879).

"The entire method is so unlike the English pronunciation of Latin as not to be understood by one who has not made a long and diligent study of it with careful and frequent practice. It makes the study of pronunciation a difficult, repulsive and unnecessary prelude to the study of Latin. . . . How easy and rational to pronounce the Latin word and its English derivative in the same way; vivid and *vividus*, circumjacent and *circumjaceo*! . . . Attempts to use other systems [than the English] are ineffectual, misleading, and detrimental to genuine scholarship, both Latin and English."—Undated pamphlet, reprinted from *The North Carolina Teacher*.

"So far from the system resting upon a basis of truth, the want of harmony among its supporters discredits the evidence adduced in its behalf, and renders uniformity of practice impossible."—M. M. Fisher's "Three Pronunciations," 3d ed. (1884), p. 179.

"Will you allow me to thank you for the satisfaction which your 'Three Pronunciations of Latin' has afforded me? Such a work was sadly needed, and I think it has come at the right time. My impression is, that it has caught the 'Latin Pronunciation' on the *down-grade*, and has given it a blow which I sincerely hope will *help* to send it to perdition."—*Id.*, p. 216.

"I am a total stranger to you, but take the liberty of a brother professor to offer you my best thanks for your capital book on the pronunciation of Latin. . . . One thing I am fully persuaded of, and that is that our would-be classical reformers will not only murder Latin, but slaughter English in the bargain."—*Id.*, p. 215.

"There is another phase of this threatened REVOLUTION,* . . . the SPELLING REFORM. . . . That the *Reform Association aim at revolution in English orthography* is as certain as that two and two make four. That the reformed Latin pronunciation means revolution in Latin is just as certain. . . . *Reform* in English spelling and *reform* in Latin pronunciation are natural allies. . . . The hard method must come into our vernacular as an inevitable necessity. For Professor March says, 'We shall pronounce [Latin], of course, as the Romans did.' Hence the English and the so-called Continental modes of pronouncing Latin, according to Professor March, will no more be thought of; and, worst of all, and positively sure in process of time, will be the dragging of our noble English tongue,

* The small capitals and the italics belong to the original.

with all its hallowed associations, back to the hard, harsh, and uncouth standard which Roman Latinists insist characterized the stately Latin two thousand years ago."—*Id.*, p. 168f.

Here are arguments much like those one meets nowadays against the proposed scientific alphabet—arguments from expediency, arguments from the quiver of an out-of-date scholarship, appeals to passion and prejudice.

Vigorous expression was sometimes not wanting on the other side: "That [i. e., the English pronunciation of Latin] is merely a jargon produced by deafness, carelessness, confusion and isolation. It has no merit except a supposed utility to schoolmasters, which I think overestimated."—Another *London Times* correspondent.

The reform of Latin pronunciation won its way in America and in England because it had the best linguistic scholarship behind it. The reform method of teaching living languages is winning its way to-day because present-day linguistic scholarship is behind it. The reform involves a study of phonetics as the *basis* of language instruction, as the first step for the beginner, whether a child in the primary years just learning to read its mother-tongue or a boy in the higher grades taking up the study of a foreign tongue. Advanced language work is still more dependent upon phonetics. Phonetics is the science of speech-sounds, the material of which language is composed. In all the Scotch Training Schools for teachers the study of phonetics is a required subject; and in England also, where the government Board of Education has recently lessened the requirement because of too great pressure upon the students, the Training Schools and the teachers are demanding that the subject be restored to the compulsory list.* Progressive teachers of English and of foreign languages in England are following close in the wake of their continental colleagues.

It has seemed needful to point out (1) the weight of authority behind the movement to adopt a national phonetic alphabet in this country, and the substantial agreement of all our phoneticians, philologists, and leading educators in the results thus far attained, (2) the grounds of objection to a key of the Webster kind, and (3)

* See *Mod. Lang. Teaching*, Feb., 1910, and a communication from F. M. Purdie on pp. 129-132 in Volume V (1909) of the same journal.

the great need—indeed, absolute necessity—of a national scientific alphabet to-day, as an instrument for the study and teaching of the native and foreign languages, and as a simple but accurate way to indicate the pronunciation of words in our multitude of school-books and reference works. These are important matters for consideration, and Dr. Whipple's pamphlet leaves most of them untouched. The conclusions that he draws from his limited experiments, even if they were justified by his results, leave still a great deal to be said before one can intelligently and rationally decide against the adoption of the key proposed by the N. E. A. committee. And if it were shown that his experiments were materially unfair and quite inadequate, and moreover that the results were at times wrongly interpreted, in some specific points actually reversed, and that his conclusions from them were therefore baseless, his work must, for every intelligent reader, offer little ground for opposition to the N. E. A. alphabet.

That such, in fact, is the case, a review of his pamphlet will show.

II

It remains now to examine in some detail the experiments that Dr. Whipple made, the manner in which he handled his results, and the reasonableness of the conclusions that he drew from them.

In his introductory paragraphs Dr. Whipple refers to the grounds upon which objection has been made to the N. E. A. alphabet: (1) "Practically every elementary textbook in spelling, reading, geography and history in use in this country must be revised"; (2) "Thousands of teachers will have to drop a familiar system and learn a new one"; (3) "It has also been pointed out that the Proposed Key is open to certain obvious criticisms from the standpoint of philology."

As to these objections, one must recognize that the first has been much magnified. There is not now, and has not been in the past, uniformity of usage in the mass of books referred to. The Webster key itself has been greatly altered with each revision of the dictionary. Not all the textbooks assumed to use that key really do use it as it is or was. If Dr. Whipple will examine the spellers, readers,

and other schoolbooks in current use, he will find a portion of them using a pronouncing key other than the Webster; and of those using the Webster, some modify it.

Nor is it any more accurate to say, as some opponents of the N. E. A. alphabet urge, that the adoption of that alphabet will render useless the thousands of reference books in American libraries and homes. Besides the Webster dictionaries, only two such works published in this country use the Webster key, and only one of these, *The New International Cyclopedia*, is an important general reference work. On the other hand, the N. E. A. key has been adopted for future editions of the *Standard* dictionaries of the Funk & Wagnalls Company, and the International Alphabet in a new series of bilingual dictionaries for school use, namely, the *International Uniform Dictionaries* published by Hines, Noble & Eldridge, and a slight modification of the International Alphabet in the serviceable and inexpensive *Dictionary of Hard Words*, by R. M. Pierce, published by Dodd, Mead & Co., 1910. Other American dictionaries and cyclopedias either use a special key of their own (as *The Century Dictionary* and Worcester's), or else (as the majority of them) none at all. No work of English origin, of course, uses the Webster key. All such books will remain in use, as now, until they are worn out or superseded by better.

Furthermore, to say that the adoption of the N. E. A. key will throw any current schoolbooks out of use is to mislead the public. Textbooks in our public schools are frequently changed.* Now, the N. E. A. alphabet could not at once be introduced everywhere, and it is not well that it should be; for teachers must first learn how to use it.† A manufacturer can not suddenly put improved machinery into his plant, however more efficient the new may be. His workmen must know how to use it.

But that is the second objection that Dr. Whipple recalls: thousands of teachers will have the task thrust upon them of learning a new key. Wouldn't it be a good thing to happen? No one can ob-

* In fact, publishers will be found that welcome a frequent change. The ethics of it is left to the reader's conscience.

† Indeed, practically all of the objections that have been made in England to the introduction of the phonetic method in language teaching arise from *abuse* of the method in the hands of teachers not prepared to use it.

serve what a great advance has been and is being made in the teaching of living languages on the other side of the ocean, without recognizing that elementary as well as advanced language instruction in this country will gain immensely if our thousands of teachers could have the opportunity of following their foreign colleagues in improved methods and improved means of language work. Give them the opportunity to do this better work. Few of them will not eagerly grasp at it. The task of learning so consistent and simple a key as the N. E. A. is not insurmountable; on the contrary, under proper guidance, it is negligible. By the time that new editions of texts are needed, teachers can be ready to use them, and the new, simple, rational alphabet proposed by the N. E. A. committee can be incorporated without financial loss to publisher or pupil. And the gain to American schools in efficiency will be beyond reckoning.

The third objection that Dr. Whipple recalls—"certain obvious criticisms" of the N. E. A. key "from the standpoint of philology"—is nothing short of grotesque. Corral all the reputable English philologists in England and in America; you will not find among them one champion of the Webster kind of key, nor one acquainted with conditions in this country who will not recognize the N. E. A. as a *scientific* alphabet well adapted to the situation which it is designed to meet.* No one of its supporters will say that it is really perfect, for it must in the nature of the case serve two masters, the *necessity* of having a scientific key for successful work in the study of speech-sounds in the primary room and higher, and, on the other hand, the *need* of making that scientific alphabet at the same time simple and easy enough for general use. The ideally perfect is unattainable. But the N. E. A. key is so immeasurably superior to the Webster—from the scientific philologist's point of view—that hesitation between the two is for the philologist unthinkable.

Dr. Whipple then puts a question as to a possible fourth objection to the N. E. A. key: Is it not pedagogically inferior to the Webster? A minor bit of evidence against the key Dr. Whipple finds in the fact that "the only system of primers published in this country that incorporated a system of key notation at all like that now proposed has been a complete failure and has been withdrawn from the

* In Appendix II the reader will find resolutions recently passed by the three leading philological societies of America endorsing the N. E. A. key.

market. Nevertheless," Dr. Whipple goes on to say, "it will not do to reject the Proposed Key on this evidence alone, since the failure of the primer in question may have been due to other defects than its phonetic system." The assumption that there were other defects in this primer is wholly gratuitous—at least, defects of a kind that Dr. Whipple's words suggest; for possibly the sole defect of the primer may have been in its being ahead of the times. In which case the remedy is to move forward!*

Putting aside the minor bit of evidence that the fate of this primer may offer, Dr. Whipple tests the relative merits of the Webster key and the N. E. A. key by means of four experiments; and the conclusions that he draws from his results he summarizes as follows:

"We have no hesitation in declaring that the key proposed by the Committee of the National Education Association is inferior for pedagogical purposes to the Webster Key now in common use."

One must first notice in Dr. Whipple's experiments a limitation of field, and certain underlying defects, which render his conclusions of less authority than many of his readers may think; and, in the second place, one must recognize that the results of certain of the tests were wrongly interpreted, so much so that at times the rational conclusion—if any conclusion at all is warranted from such hurried work—is the direct opposite of that which Dr. Whipple draws.

(1)

1. Dr. Whipple's test of the two alphabets, especially in Experiment A, was limited to the use of them as pronunciation keys. A phonetic alphabet has other pedagogic uses. Dr. Whipple does not consider the relative merits of the two keys as, for instance, instruments for general phonetic work, that is, instruction in the nature and classification of speech-sounds and training in the reproduction of such sounds. The importance of such work, and the necessity of having a rational phonetic alphabet to do the work with, one may

* To see ourselves as others see us, read the following from one of the leading English educational journals: "We have very long wondered at the very unprogressive character of the American publisher of books for modern language teaching, and, in particular, at the absence of good schoolbooks that pay regard to the modern advance in phonetics" (*Mod. Lang. Teaching*, July, 1911, p. 143).

learn who considers only briefly what has been done and what is being done with phonetics in Europe and in England. Nor does Dr. Whipple undertake to show the relative merits of the two keys for beginning students in foreign languages. There is, indeed, no need to do this; for experience has already decided in favor of a scientific alphabet (see pp. 25ff. above). Dr. Whipple, again, takes no account of the absolute necessity of a scientific alphabet in all advanced study and training in the science of phonetics, a science that is the sole basis of all other scientific study of language. Furthermore, Dr. Whipple does not take notice of the fact that scientific bodies like the U. S. Geographical Bureau, the Bureau of American Ethnology, the Royal Geographical Society, have already adopted a scientific alphabet on the basis that the N. E. A. uses, and that their practice is in time sure to be followed by compilers of popular handbooks that use their material. So that, even if the Webster key were the easier to learn, it would not be universally serviceable. However, it was quite right for Dr. Whipple to put upon his investigations whatever limits his time and his material dictated; only, this must be emphasized: his conclusions, even if justified, are not the whole of the matter.

2. But the limitations marking his experiments are not all that lessens the force of his conclusions. He tests the two alphabets on conditions so unequal that his results were foregone; for (a) the persons submitting to the experiments (both grade pupils and college students) were distinctly, though perhaps in cases unconsciously, possessed of a knowledge of a greater portion of the Webster key than of the N. E. A.; (b) the time given to learning the keys was altogether too brief for the results to be permanent, the defect working, of course, to the disadvantage of the less familiar key; and (c) those who conducted the experiments seem not to have been familiar with both the instruments they undertook to test, and not to have used the newer instrument to its best advantage.

(a) The Webster key is based upon English alphabetic and pronunciation values.* In the mere process of learning to say the alphabet, a child begins to associate with the letters the sounds that are heard in their alphabet names. In spelling and reading his eye later meets time and again certain combinations of letters in a

* The statement is of consequence in the present discussion chiefly when applied to vowel symbols.

given phonetic value, and grows more or less familiar with them, so that it should be easier for him to accept them as phonetic symbols. Further, if his textbooks provide respellings in the Webster or any like key, he will have, by the time he reaches the end of the Seventh Grade, a very definite sense or feeling for certain symbols as embodying in themselves certain sounds. The Webster symbol oo , for example, is striking enough, and the words in which it has the Webster value are frequent enough, to make the "double-o" an old acquaintance to a seventh grade pupil. Only one of the Webster pupils in Test 6 of Experiment A (Appendix B) failed on the "oo"-part of the symbol; about one-third of them, however, confused the diacritics. It is impossible to avoid the conclusion, from a study of Appendix B (Whipple, pp. 29-30), that the chief source of error of those pupils using the N. E. A. key was the attempt on their part to give the alphabetic or some known pronunciation-value to the symbols.

In fact, a theoretical consideration of the question is not needed here. The reader should merely consult Dr. Whipple's own figures, in Appendixes G and H, to see how overwhelmingly a child, *after* it has got fixed in mind the association of letter and sound forced upon it by conventional English spellings, interprets unknown or vaguely known phonetic symbols in the values suggested by conventional spellings—which, in the case of several Webster symbols, are identical with the Webster values.

For a psychologist, Dr. Whipple underestimates astonishingly the degree in which the average seventh grade pupil must be assumed to be familiar with the Webster key. On page 9 he attempts to make some allowance for it. He says: "It may be objected that we have not allowed for the fact that a few pupils knew the long and short values of the vowels *a* and *e* in Key 1 [the Webster key]. This objection is partly met by the inclusion of one more character in our test. To obviate it entirely, we may exclude all reference to these four vowels. By consulting Appendix B it will be found that 19 errors were made with these four characters. When these are subtracted, we have left 20 characters and 18 pupils, a total of 360 cases, with a total of 91 errors, or 25.3 per cent wrong. Hence the elimination of the four Webster symbols known to a few pupils actually *reduces* the per cent of wrong pronunciations in this

key from 25.5 per cent to 25.3 per cent. Accordingly, the fact that our results in Test 6 indicate a decided superiority of the Webster Key can not be attributed to the slight knowledge of this key possessed by a few pupils."

Dr. Whipple here speaks apparently of the knowledge the pupils may be supposed to have had of the Webster key previous to their five lessons. Now, why does he assume that knowledge limited to these four symbols, *ā ā ē ē*? Let the reader turn to page 22 of Dr. Whipple's report, where the author is stating the results of Experiment C with thirty-eight Ithaca grammar school children who (presumably) had had no previous instruction in either key. Dr. Whipple there says: "To be more specific: '*ā*' is pronounced according to Webster 132 times, according to the Proposed Key, 9 times; '*i*' is pronounced according to the Webster Key 128 times, according to the Proposed Key, 4 times; '*ē*' is pronounced according to the Webster Key 121 times, according to the Proposed Key, once; '*ū*' is pronounced according to the Webster Key 45 times, according to the Proposed Key, 8 times." *

On Dr. Whipple's own showing, then, he should have excluded also *ī* and *ū*; for by Experiment C he proves that these, as well as *ā* and *ē*, are overwhelmingly pronounced in the alphabetic values of the letters (which are the Webster values of the symbols) by grammar pupils who (presumably) have had no previous instruction in the Webster key. If we "exclude all reference" to these symbols also, we shall have, for Test 6, on the Webster key, 18 symbols and 18 pupils, a total of 324 cases, with 85 errors, or 26.2 per cent wrong—an *increase* of .7 per cent instead of Dr. Whipple's decrease of .2 per cent. But to Dr. Whipple, as to Macbeth, came figures that "marshaled him the way that he was going."

More than that, there are some things here pertinent that Dr. Whipple apparently did not see. He shows a blindness to certain facts that seems strange in a psychologist. Our present question, throughout Experiment A, is not only as to what Webster symbols the Cortland grammar pupils, before their instruction began, would be likely to pronounce in the Webster values, but also as to what help in learning other symbols they would have from their

* For *u*, the revised statement that Dr. Whipple makes in his footnote, p. 22, is incorporated above.

already fixed knowledge of alphabet-names and *pronunciation-values* of the letters appearing in the Webster symbols.

Let us dismiss all recollection of Dr. Whipple's appendixes and tables, and ask ourselves the questions: What Webster symbols are, from the start, likely to be read by seventh grade grammar pupils in the value assigned them in that key? and what further symbols would be especially easy for them to learn, precisely by reason of the Webster leaning on alphabetic and pronunciation values?

One can hardly be blind to the fact that the alphabet-names of the vowel signs would be the first sounds to suggest themselves, and in the case of the long vowel signs (*ā ē ī ō ū*) would at once fix themselves in the mind upon presentation of a familiar key-word. There is, further, no doubt that the Webster symbols *oi ou*, when presented with the key-words *oil out* beside them, would offer no difficulty. The combination *oi* every pupil had repeatedly met, in familiar words, and always with the value (N. E. A.) *ei*. So the letters *ou*, also, in one after another simple and familiar word, had for every pupil spelled (N. E. A.) *au*. For the Cortland grammar pupils, the acceptance of the Webster symbols *oi ou* meant simply the acceptance of the *letters oi ou* in their known pronunciation values. The Webster consonant symbol *zh*, too, after once being seen, would be remembered; it is easy to remember as a parallel to the perfectly familiar *sh*. Of the short-vowel symbols, *ē* and *ī* would offer little difficulty because the letters here involved appear (obscure vowels disregarded) in only two symbols, the so-called "long" and "short" (*ē ē, ī ī*), of which the former (*ē ī*) fix themselves at once with alphabet-name values, leaving the other two, without confusion and without difficulty, to be associated with familiar key-words *end* and *ill*.

But the case would be different with *ā ō ū*. These would be hard for the pupils to learn, because (in the first place) of the number of symbols using the same letter with varying diacritic marks: *ā â â ä ä; * ō ó ô õ; ū ũ û*. Manifestly,

* Confusion, it would seem, must inevitably arise among so many "a"-symbols. That it did arise, Appendix B (Whipple, p. 29) shows. Hence one wonders why Dr. Whipple chose *ä* as one of the four symbols of which some of the pupils had "slight knowledge." If he had not included *ä* in his little group of four "knowns," his figures would have been reversed; the result would have

the difficulty of remembering all the symbols in each of these series, and distinguishing each symbol from its comrades, is far greater than with a series of two, like $\bar{e}$ $\check{e}$ or $\bar{i}$ I . A child is likely to remember the first of each series here ($\bar{a}$ $\bar{o}$ $\bar{u}$), because its value is the alphabet-name of the letter; but on the others he would easily fall into confusion. Further, several of the vowels in question are muffled, back vowels, difficult to make with exactness, and to recognize with exactness when made. This is especially the case with the sounds whose symbols involve the letter u . Only by effective phonetic training can one bring ear and speech-organs to an intelligent and confident mastery of these sounds. To test untrained or ill-trained children on them is to invite confusion.

We hold it to be highly probable, then, that a grammar-school pupil would have little difficulty, if any, with the following Webster special symbols (of the 24 used in Test 6 of Experiment A): $\bar{a}$ $\bar{e}$ $\bar{i}$ $\bar{u}$ $\check{e}$ I oi ou zh . If Dr. Whipple cares to "exclude all reference to these" nine symbols, well and good. But if he eliminates $\bar{a}$ $\check{a}$, $\bar{e}$ $\check{e}$ without eliminating also $\bar{i}$ $\bar{u}$ I oi ou zh , he has his trouble for nothing. He can prove nothing unless he is consistent in his argument. It is not consistent to eliminate four symbols on the ground of their "slight" familiarity when there are at least six others equally or better "known" to the pupils at the start, in the midst, and at the end of their lessons.

If we eliminate our nine symbols, we have left 15 symbols, or 270 cases, with 90 errors. That is, 33.3 per cent wrong, instead of Dr. Whipple's 25.5 per cent. Dr. Whipple might better have found an increase of 7.8 instead of a decrease of .2, in his percentage of errors made with the Webster key, in Table 2.

Dr. Whipple may not be willing to go in the direction that these figures marshal him; but he must at least accept the figures of his own Experiment C. These point him the same way, if he will trust them for guidance as to the knowledge a grammar pupil is likely to have of the Webster key—or, rather, is likely to appear to have; for at the beginning it is knowledge of the English alphabet and of English pronunciations.

Indeed, no intelligent man can fail to recognize that, with pupils been an increase instead of decrease in the percentage of symbols wrongly pronounced.

of the Seventh and Eighth Grades, and with college students as well—that is, with persons for whom English conventional spellings and pronunciation values had become instinctive—the Webster key, because it is based upon alphabetic and pronunciation values, would start with a distinct advantage over a genuinely phonetic key like the N. E. A., even if the subjects of the test had had no previous specific instruction in the Webster. For the first few periods of learning, the Webster would be greatly helped by the fact that to every one who can read English a number of the Webster symbols would have become familiar in the Webster value along with other values, so that the learner has merely to fix in mind one of two or three already known values. These half-familiar symbols could be quickly learned. Throughout further study of the key the Webster would still find some help in the fact that in each case the key-word is a familiar English word containing in its ordinary spelling the symbol itself, and so helps the learner to remember it. These advantages the Webster key would have (with pupils advanced beyond the primary) because of its leaning upon the English alphabet-names and English spelling values—the very thing about it that makes it—chiefly in its vowel symbols—impossible as a genuinely scientific phonetic key.

On the other hand, consider the difficulty that some of the N. E. A. vowel signs must present at first sight to any one familiar with the English alphabet names and with English conventional spellings (cf. pp. 23f. above). Think of the shock it must bring when for the first time one who has for years been saying “*a e i o u*”, as in the English alphabet, is told that *ē* is not *ē* but *ā* (Webster symbols are used because the matter is put from the alphabet-name point of view), *ī* is not *ī* but *ē*, *ū* is not *ū* but *ōō*.

The N. E. A. alphabet begins the race with a heavy handicap.

But Webster adherents (other than Dr. Whipple) will perhaps say: That is just what we assert. The Webster key is already in good part familiar; it is easier to learn because it can lean upon alphabetic and pronunciation values already perfectly familiar to the pupil. The N. E. A. key is difficult because in the case of some symbols the pupil must turn topsy-turvy a set of associations as familiar to him as his own name. It is like asking him to write his name backwards. The Webster key is the “natural” key.

Dr. Whipple, indeed, is far wrong when he declares that the subjects tested in his experiments had only "slight knowledge of the Webster key," and worse than wrong when he attempts to prove it by eliminating only a part of the symbols that were certainly in appreciable measure familiar.

(b) The assumption that the two keys were practically on equal footing is an error on Dr. Whipple's part that underlies all his work and destroys the force of his conclusions. Further than this, the time he gave to the experiments was inadequate for the portion of the Webster key that he used (the most puzzling portion of that key he excluded), and for the N. E. A. key, taught in the way that he taught it, the time was farcical.

In Experiment A pupils of the Seventh and Eighth Grades met for study five times. Each time they pronounced *once*, following the director, each of a series of 44 or 46 sounds and key-words, at the same time looking at the phonetic symbol of the sound and at the key-word. The first time they did this, their attention was specifically called to the form of the symbol. That was the whole of their instruction. At the end of it the Websters were far from complete mastery of their key; the N. E. A.'s, having started pretty far behind their rivals, were also far from complete mastery of theirs. In the fourth and fifth lessons, however, they were catching up.

Nor did the college students in Experiment B learn thoroughly either key; none of them reached complete mastery of even the Webster.* They started with a predisposition, ingrained, life-long, to assign to the symbols the English values. They may not have consciously learned any part of the Webster scheme; but in much of their reading and study, especially in the lower schools, they had here and there, with greater or less frequency, run across phonetic symbols of the Webster kind. Six of those symbols (ā ē ī ō ū oi) were perfectly familiar to them, or at least learned with perfect ease; eight more (ă ě ĩ ǫ ū ōō ǫǫ ou) should not have taken more than a second thought. The students' study of foreign languages was not of the importance in this test that Dr. Whipple assumes; for such knowledge is at best left-handed. English was

* On page 19 Dr. Whipple, in comment on Test 3, Experiment B, says that the considerable number of "common errors" "gives further evidence of the difficulty of this test." It gives also evidence that the keys were neither of them "learned."

their right-hand speech, in constant use and practice. It is the English value that unconsciously and instantly sprang up before them. The key-words were familiar English words in which the letter-portion of the symbols themselves stood in the Webster value. That the key-words were not shown to the students was of little consequence because persons of their maturity could instantly visualize the words. In these conditions it was only natural that to attain an errorless recitation would require more repetitions of the N. E. A. key than of the Webster; and that the knowledge of the N. E. A. symbols, having been on the average for a shorter time in the possession of the students, was not so stable.

That this was the state of things with the college students, as with the grade pupils, every person who considers the matter will recognize; and the fact is, moreover, proved by Dr. Whipple's figures in Appendixes G and H, where it is brought to the test with both school children and college students.

The various tests demonstrated that English-speaking persons whose habits of speech have become fixed, require an appreciable time to memorize the symbols of either key; and that, when the time is inadequate, the less familiar key suffers more than the other from that lack of time. But the tests do not show which key is the hardest to fix completely in mind; the experiments were too brief, the learning periods inadequate. Nor do the tests show how the N. E. A. alphabet would fare in primary instruction in reading, the place where the child should get its first knowledge of speech-sounds.

Hundreds of trained men have experimented with phonetic alphabets, on a far larger scale than Dr. Whipple did. The experiments have covered a wide range of country, in hundreds of "laboratories," and a wide range of time as well. The results of these multiplied thousands of experiments led the army of experimenters all to the same conclusion—a conclusion just the opposite of that which Dr. Whipple's brief five lessons with about seventy seventh and eighth grade pupils led him to publish. And these hundreds of experimenters who do not agree with Dr. Whipple are men who *know* the material that they are working in. The conclusions that the modern language teachers of all Europe and practically all the modern language teachers of Great Britain, and further that many teachers of the mother-tongue, too, in all those countries, have reached

—the conclusions of these hundreds of highly trained and experienced teachers, based upon an extended experience for each of them, is rather more trustworthy than those arrived at in one scientific laboratory, on the basis of one week's work with some seventy school children and a few hours' work with three dozen or fewer college undergraduates. The matured opinion of these hundreds of teachers is that a rational phonetic alphabet—the N. E. A. kind—is the most efficient means by which to instruct pupils in the art of pronunciation, the easiest kind of alphabet to learn intelligently and to apply.

(c) These teachers, it should be repeated, know something of phonetics, of the nature and relations of speech-sounds, of the difficulties inherent in their task, of the specific effects desired to be attained by a phonetic alphabet, of the specific qualities needed in such an alphabet to make it an effective instrument, and of the specific ways in which such an instrument is to be handled in order to make it efficient.

It is not apparent that those who conducted the Cornell experiments were familiar with the material in their hands. Indeed, Dr. Whipple himself shows a lamentable uncertainty in the phonetic values of some N. E. A. symbols and the normal usages of educated Englishmen and Americans (cf. pp. 13ff. above); and he or his associates showed some unfamiliarity with the difficulty that every one who is not a trained phonetician has in recognizing and reproducing speech-sounds by imitation alone (cf. pp. 27f. above). In illustration of that difficulty, look at Dr. Whipple's Appendix B, page 29 of his pamphlet. In every case where a pupil translated an o-sign ($\ddot{o}$ $\hat{o}$ $\check{o}$) into the sound $\bar{a}$ or α (Webster $\ddot{a}$ $\acute{a}$), a sound heard in the first syllable of *artistic*, it must be interpreted as an intention of the pupil to give the so-called "short o" of the key-words *odd not*. The great majority in this country pronounce these words not with the sound represented by the N. E. A. symbol ϵ (Webster $\hat{o}$ or $\check{o}$), but with the clear vowel sound of *artistic*. To expect pupils who have this habit of pronunciation to recognize and correct their deviation from the value assumed in both keys to be the standard value of the *o* in *not*, by a process of merely hearing the sound five times, is to expect the impossible.

Further evidence that the experimenter was not in position to

direct, properly, experiments in phonetics appears in his "Directions for Conducting Experiments with Phonetic Keys," Appendix I, p. 37. In the section (4a) under the heading METHOD (p. 38) one reads: "Now, the vowels, a, e, i, o, u, have different sounds, as you know, like 'ay' and 'ah', 'ee' and 'eh', and so forth." But *a e i o u* are *letters*, not *vowels*. A vowel has one measurably fixed sound—it is a sound. To say that "the vowel *a* has different sounds," when you mean that "the letter *a* represents different sounds," is to use terms unscientific, and confusing to any one attempting to get clear notions about the relations between sound and sound, and between sound and letter. No experiments with phonetics, directed by persons who use so loosely the terms of the science, can be accepted as trustworthy. In several tests it appears that the experimenter does not realize that it makes any difference whether he gave the *letter-name* or the *sound-value* of the symbols he spoke of; which would not be surprising in an experimenter who is not at the same time a phonetician, but should be surprising in an experimenter who is a psychologist.

What is necessary for the subjects of experiments with phonetic keys is some authoritative and competent instruction in speech-sounds, some training by practice in the recognition of the smaller differences in sounds and in the accurate reproduction of those sounds—some training of ear and speech-organs by an instructor who knows something of phonetics. Some of the Webster symbols would have fared better if the subjects under test had had proper instruction.

But the N. E. A. key fared far worse because there was no attempt to present it on its most telling merits, namely, its inherent simplicity and logical consistency. These are qualities that make it incomparable with any key of the Webster kind (cf. p. 17 above). It is easy to learn because, when the eleven or twelve simple elements of the vowel-scheme are once mastered, the whole English vowel-scheme is in the learner's possession; for he needs only to combine the elements in a fixed and consistent way to represent the varied values of the twelve English vowel sounds not interpreted by the fundamental eleven signs. His instinctive, unconscious-acting rational sense does half the work. To throw away the help that reason gives, and to learn the N. E. A. vowel system in the same way that one must learn the Webster—that is, by sheer force of memory

—is like resorting to forge fires and sledge hammers when the subtle electric current would weld the metals with a fraction of the labor and time. That is what the conductors of the Whipple experiments did. They did not show their pupils how to learn and how to use the N. E. A. key.

One may have in one's hand a delicate instrument, but that doesn't mean that one knows how to use it. A chemist, however competent in his own sphere, can not step into a watch factory and at once set to using the watch-maker's fine machinery without disastrous results; and when such results follow his attempt, they can not be interpreted as sufficient ground for condemning the machinery itself.

Dr. Whipple recognizes that his investigations leave something to be desired in thoroughness and completeness. He does not, however, appear to realize how inadequate and one-sided they were. Not five days but a year or two in time is necessary. The experiment should be made not with pupils or students who have already ingrained in them associations that years of use of the English conventional spellings have fixed, but with pupils who are beginning to learn the language—with children in the primary reading classes, or with American-born children of foreign parentage who have not yet fixed the one language in mind to the exclusion of the other. And, above all, the experiment must be in the hands of conductors whose training fits them for the specific task—of language teachers who know something of phonetics, who know how to teach it, and who have mastered the key that they attempt to use.

In short, any experiments testing two or more specific phonetic keys, should be directed by expert phoneticians, and carried out by men who represent equal knowledge of and sympathy with the keys in question.

It will take some time to make such an experiment; but it is better to walk six blocks for an accurate watch than five blocks for a poor one.

But overtopping all these fundamental errors, there was yet a fourth error vitiating all of Dr. Whipple's experiments, which one finds it hard to excuse. Dr. Whipple used in his work the portion of the Webster vowel symbols which is least open to objection. He eliminated from both keys a portion, namely, the symbols for the

"obscure" vowels, in which the superiority of the N. E. A. key is most marked, the confusion of the Webster most trying (cf. pp. 12-14 above). Whatever the grounds for the action, it was wholly unwarranted, and irretrievably biased the results. The Webster symbols for the obscure vowels ($\text{ä} \text{ê} \text{ô} \text{û} \text{ă} \text{ě} \text{ō} \text{ŭ} \text{à} \text{é}$) are five times the number of the N. E. A. ($\text{ə} \text{ } 1$), and indefinitely more confusing. Let some mathematician figure out how many more permutations are possible with a series of ten than with a series of two. Furthermore, some of the Webster symbols appear now in the value of ə and now of $\text{ } 1$; so that it is as impossible for a phonetician as for a psychologist to interpret such symbols when standing alone. Only when such a symbol is recognized as representing a sound in a word whose pronunciation one already knows, can one pronounce the symbol itself. As a guide to the pronunciation of unfamiliar words, then, it is futile. If Dr. Whipple excluded these symbols on his own motion, and with full knowledge of what he was doing, it is hard to understand his action on grounds creditable to him.

One must condemn also, as ingenuous and shuffling—to choose mild terms—a phonetic alphabet for general use that professes to find, and provides symbols to represent, ten varieties of sound where, except in special expert phonetic investigations, only two are recognized as existing in current good usage. Such an alphabet flatters the unwary into believing that they make certain "finer distinctions in sound." Many others than Dr. Whipple are no doubt victims of the Webster "obscure" brotherhood.

In their effect upon Dr. Whipple's tests, the ten Webster symbols, if admitted, would spell disaster to the Webster key. Admit them. Let a rightful proportion of the tests involve the use of them. The case of the Webster key would be hopeless! If this should prove to be the fact which explains why they were eliminated, the procedure has no palliating feature. It would be with pain and humiliation that one discovers that such a thing—the suppression of an incriminating portion of evidence—could be possible to an American man of science. Nothing can excuse Dr. Whipple's action, except his apparent ignorance of the field into which he had ventured.

A famous saying of Gaston Paris expresses the ideal of the scientist: "I profess absolutely and without reserve the doctrine that

science has no other object than the truth, the truth for itself, with no regard for the consequences good or evil, lamentable or happy, that this truth may have in its application. He who, through any patriotic, religious, or even moral motive, allows to himself, in the conclusions that he draws, the slightest dissimulation, the slightest alteration, is unworthy to have his place in the great laboratory where integrity is a more indispensable title to admission than skill."

Dr. Whipple's experiments, testing two phonetic alphabets on such unequal terms, running through a period altogether too brief to attain any stable results, and conducted in a way to deprive one of those alphabets of the advantage of the very qualities in it that give it superiority, can lead to no conclusions acceptable to intelligent and fair-minded judges.

(2)

What if some of these conclusions are not justified by the experimenter's own figures? The experiments must be examined in some detail.

EXPERIMENT A

The error that Dr. Whipple falls into when he eliminates (Whipple, p. 9) only a portion of those Webster symbols that must have been pretty familiar to the pupils, has already been pointed out (pp. 42ff. above). Consider further the experimenter's use of the figures that he obtained from Tests 1 and 2 in Experiment A, and published in Table 1, p. 5, of his pamphlet.

About seventy grammar pupils had one learning exercise a day for five days. The exercise consisted of looking at a phonetic alphabet (symbols alongside key-words) while they repeated, in concert, following the instructor, the sounds that were represented by the symbols, and the key-words that accompanied each symbol. At the end of the third learning exercise the pupils were subjected to Test 1, and at the end of the fifth to Test 2. The tests were the same: "The method was to display, one at a time, in order, a series of enlarged symbols, . . . and to request the pupils to write the key-words that had been learned to illustrate the several symbols."

Now, thirty-eight of the pupils were working with the Webster key. It is evident that the sources from which these drew their interpretation of the Webster symbols were—(1) The alphabet names of the letters, which were readily associated with the macron-marked symbols. (2) Diacritic marks that were up to that time in a measure unfamiliar; for, it being an exercise of memory alone, anything new and striking and at the same time clear in the symbol form would fix the attention sharply enough to engrave the symbol with more or less durability upon the mind. Hence it is probable that the pupils were relatively less impressed by the more familiar macron and breve than by the dieresis (¨), the dot (·) and the tilde (~). The last especially ingratiated itself; its curves are beautiful. It probably happened also that the dieresis and the dot, coming, as they did, over symbols near the beginning of the list, stood a better chance of sticking in the memory than the macron *plus* dot of the symbol $\ddot{o}$. The circumflex may have failed because it is not distinctive nor clear enough; it may have been confused with the macron and breve; it appeared over several of the symbols, and apparently led to some confusion. (3) The pronunciation value of certain combinations assuredly helped to associate symbol with key-word.

On the other side, thirty-one pupils studied the N. E. A. key. In this key four symbols had values other than the alphabet-names the pupils would have naturally associated with them: $\bar{a}$ $\bar{e}$ $\bar{i}$ $\bar{u}$; and the N. E. A. values of two of these ($\bar{e}$ $\bar{i}$) would at first arouse consternation and resentment in the minds of the pupils. There were seven new vowel signs ($\bar{a}$ α αi $\bar{o}$ ϵ $\bar{u}$ υ ; which would have reduced themselves to three if the key had been properly put before the pupils), and three partly new (αu $i u$ ϵi ; these would have been self-explanatory if the pupils had been properly instructed). One of the N. E. A. consonant-signs also was totally strange (ʒ), and another half new (η).

Apparently the N. E. A. group had before them distinctly the harder task: more symbols that were totally new, and some that were directly subversive of associations fixed from their childhood by the abc names. A test at the beginning of the experiment would have shown whether any of the Webster symbols were (as seems to a layman probable) half known, or better, at the start. One would

then have had also a longer period in which to compare the progress of the two groups.

Fortunately, Dr. Whipple himself furnishes us data, in Appendixes G and H, from which to infer the probable conditions upon which his Experiment A began. In Experiment C he put before thirty-eight fourth grade school children, who—so far as Dr. Whipple tells us—had had no instruction in either key, a number of phonetic spellings using the N. E. A. symbols, $\bar{a}$ $\bar{i}$ $\bar{e}$ $\bar{u}$, and another list introducing the symbols ai u au . He found that the words in the first list were pronounced with the vowels $\bar{e}$ ai $\bar{i}$ iu (Webster $\bar{a}$ $\bar{i}$ $\bar{e}$ $\bar{u}$) *a total of 426 times*; with the vowels $\bar{a}$ $\bar{i}$ $\bar{e}$ $\bar{u}$ (that is, with the correct N. E. A. values) *22 times*. That is to say, about twenty times to one these N. E. A. symbols were interpreted by the alphabet-names of the letters; that is, virtually, as if they were Webster symbols. (The correction that Dr. Whipple makes in his footnote, p. 22, is incorporated in these figures.)

With words containing the symbols ai u au , the children gave the N. E. A. values only 44 times, some other value 405 times. Dr. Whipple states that the symbol ai was in 200 cases [out of 252] interpreted as $\bar{e}$ (Webster $\bar{a}$), and the symbol u 66 times [out of 97] was read as u (Webster $\ddot{u}$). These were, of course, not Webster readings, but simply attempts to give the pronunciation of English words suggested by the phonetic words. The N. E. A. *pail*, for example, was pronounced as if it were the word *pail*, vain as the word *vain*. This is especially noticed in the words involving the symbol au . The symbol was 28 times (out of the 44 times that the children happened upon a correct N. E. A. reading) pronounced with its correct value; the phonetic words *aut* *laud* could not well be understood by the children otherwise than as the English words *out* and *loud*. From Dr. Whipple's own figures, then, it appears that American grammar school children set out to learn the N. E. A. key with a strong predisposition to interpret its symbols in their alphabetic and pronunciation values, which in the case of some of the symbols are identical with the Webster values. And yet Dr. Whipple speaks of their "slight knowledge of the Webster key"!

It is assured, then, that the N. E. A. group of Cortland seventh and eighth grade school children had before them, at the beginning

of Experiment A, many more symbols to learn than the Websters had; that the Webster group, on the contrary, would "naturally" interpret the corresponding Webster symbols in the Webster values. It would seem, then, that the N. E. A. group must have learned, during the first three lessons, a greater number of their symbols than the Websters learned of theirs in the same time. Furthermore, several of the N. E. A. symbols had to be learned in values that directly contradicted and subverted associations that these children had fixed in mind to a degree almost instinctive.

Considering the difficulty of their task, their accomplishment speaks with astonishing emphasis for them or for the key that they were learning.

The results of Tests 1 and 2, taken at the close of the third and the fifth lesson respectively, show how far each group had progressed at the time of the test, and hence how fast each was moving. This was the object of the tests—"to measure the speed of the memorizing" (Whipple, p. 3, last line).* (Test 4 was "to measure the permanence of the memorizing," and Tests 5 and 6, "to measure the facility with which the keys could be used.")

Dr. Whipple summarizes the results of Tests 1 and 2 in Table 1 (p. 5):

	Number of pupils	Average number of errors made in Test 1 in Test 2	
Webster Key	38	10.16	5.37
N. E. A. Key	31	14.97	9.20*

Then he gives to these figures the following interpretation, emphasizing his discovery by the use of italics: "The results indicate plainly that, *after three learning lessons, . . . the average pupil makes 10.16 errors with the Webster Key as compared with 14.97 errors with the Proposed Key, or, in other words, 47.3 per cent more errors are made with the Proposed Key.*" . . . "At the end of the fifth lesson, the average pupil makes 5.37 errors with the Webster Key as compared with 9.20 errors with the Proposed Key, or in other words, 71.3 per cent more errors are made with the Proposed Key."

Let us repeat the closing words of each sentence in order duly to impress upon the reader Dr. Whipple's discovery:

* With an apparent shifting of ground that may confuse readers of the pamphlet, the author does not use the term "speed" in his later descriptions of Tests 1, 2 and 3, nor in Table 1.

* Misprinted 9.50 in Dr. Whipple's Table 1.

(After the third lesson) *47.3 per cent more errors are made with the Proposed Key;* (after the fifth lesson) *71.3 per cent more errors are made with the Proposed Key.*

Evidently the N. E. A. children are rapidly going to the bad, whither of course the N. E. A. key ought to follow! If the two groups had taken two more lessons at the pace they exhibited in the fourth and fifth lessons, the results would have been unique. The Webster group would have reduced their errors by an average of *10.16 minus 5.37*, which is *4.79*; and consequently after the seventh lesson would have made an average of *5.37 minus 4.79* errors, which is *.58* errors. The N. E. A. group would have reduced their errors by an average of *14.97 minus 9.20*, which is *5.77*; and so would after the seventh lesson have made an average of *9.20 minus 5.77* errors, which is *3.43* errors. *In other words, about 600 per cent more errors would have been made with the Proposed Key!*

Dr. Whipple ought to have carried the experiment to a finality. He could easily have had the Webster per cent of superiority burst through the ceiling and shoot up into the heavens, or the N. E. A. inferiority descend in the other direction to quite abysmal depths.

He must have made a mistake somewhere. To a layman, expert in neither mathematics nor psychology, the case seems simply this: In two lessons the Webster pupils reduced their errors by an average of *4.79*; in two lessons the N. E. A. pupils reduced their errors by an average of *5.77*. In two lessons, then, the N. E. A. pupils reduced their errors by a greater number than the Websters did—namely, by as much as *5.77* exceeds *4.79*, which is *.98*; and *.98* is *20.5 per cent* of *4.79*. *In other words, in the fourth and fifth lessons the N. E. A. group are progressing, in memorizing their key, 20.5 per cent faster than the Webster group in memorizing theirs!*

The error that Dr. Whipple fell into, or was thrust into, lies in not recognizing that, to measure the speed that either group was making, one must compare the position of the group at one stage of learning with its own position at another stage. Dr. Whipple should have moved horizontally, not vertically, in his Table 1.*

* Even if Dr. Whipple were measuring, not the speed of memorizing, but the comparative mastery of their keys shown by the two groups, his method is wrong, as is evident from the fact that his percentages mount toward infinity. The rela-

One may feel justified in recognizing that the N. E. A. pupils must, in the first three lessons, have already much reduced the large handicap that the considerations advanced on pp. 42-45 indicate as resting upon them at the beginning; in the fourth and fifth lessons, for which we have the records, the N. E. A. pupils made faster progress by 20.5 per cent than their rivals.

And they were working with a key said to be "pedagogically inferior"!

One must turn to some psychologist for an explanation of the enigma. A psychological interpretation of Dr. Whipple's various tables would be valuable. A mathematical interpretation (Tests 1 and 2), truer than Dr. Whipple's own, is within reach of every one who has passed percentage in his school arithmetic.

Another arithmetical problem may be propounded: Two boys are playing in the yard, when they are told to go to the wood-pile. One boy is 10.16 feet distant from the wood, the other 14.97 feet distant. They take an equal number of steps in a given time, but the nearer boy moves two feet and the other two feet five inches (about 20.5 per cent more) with each step. Which boy is moving faster toward the wood-pile?

And which boy will saw more wood when he gets there?

How shall one interpret the results of Test 3? It followed one day after Test 2, and was just the reverse of that test. In Test 2 pupils were translating symbols into sounds; in Test 3 they were translating sounds into symbols.

In the first place, one must know how the test was conducted. When the experimenter, for example, said: "Write the symbol (or phonetic letter) for the *a* in *ale*," he should have said, "for the vowel-sound $\bar{e}$ [Webster $\bar{a}$] in *ale*". And what did he say next? When he told the pupil to "write the symbol for the *a* in *care*," did he say "for the sound $\bar{a}$ [Webster $\hat{a}$] in *care*," giving the sound and not the alphabet-name of the letter? Or did he give the alphabet-name, saying, "Write the symbol for the *a* [$\bar{e}$] in *care*"? If he did the latter, the test must be thrown out of court without more ado; it has not the slightest case—not a sem-

itive degree of mastery is to be found by comparing what the two groups had learned, not what they had not learned – that is, it is to be measured by how much they got right, not by how much they got wrong.

blance of one. A phonetician would recognize that the matter has a vital bearing on the problem; a psychologist ought to recognize it.

But assuming that the test was properly conducted, what shall be done with the figures? Interpret them as Dr. Whipple does those of Test 2, and get Dr. Whipple's misleading "48.5 more errors are made with the Proposed Key"? The only way to show the "speed with which" either group "is memorizing its key" is to compare the results of a test made at a given stage, to show where the children stand at that moment, with the results of a like test made with the same children at another stage in the learning. But Dr. Whipple has given no earlier test like Test 3. All that one can say is this: One day after making an average of 5.37 errors in turning symbols into sounds, the Webster pupils made an average of 6.08 errors—that is, an *increase* of .71 errors—in turning sounds into symbols. One day after making an average of 9.20 errors in turning symbols into sounds, the N. E. A. pupils made an average of 9.03 errors—that is, a *decrease* of .17 errors—in turning sounds into symbols.

"Test 4 was administered one week after Test 3, and was designed to measure, by the number of errors committed, the relative permanence of the associations in the two keys after a lapse of one week during which there was no more learning and during which the keys were not used or referred to."

Does Dr. Whipple think that none of these American children had intelligence or curiosity enough to observe during that week some things that they might not have observed before? In their textbooks in spelling, reading, history, geography (where, we are told, the Webster key is in common use), they must have met Webster respellings. Did they come upon N. E. A. respellings anywhere? Did none of them tell at home of what new work they were doing in the school? And did no one there get down the Webster family dictionary?

And Dr. Whipple's italicized conclusion is so stated as to be capable of quite false interpretation. Would Dr. Whipple allow one to understand him as saying that the N. E. A. pupils had forgot a greater proportion of their new knowledge than the Websters had of theirs—a proportion greater by 55.6 per cent? If he did not mean to leave open that interpretation of his words, he should have made his statement clearer. The only way in which to estimate the percentage of what either group forgot, is, first, to find out what it

had learned, and then to estimate its loss on that basis. Each group's measure of lost knowledge must be compared with its own measure of gained knowledge.

One is tempted to ask, sometimes, whether Dr. Whipple's method of arriving at his italicized percentages is his own or another's; one can not avoid recognizing that they often exaggerate, and thus misrepresent, the actual outcome of the experiments.

There is no question of the fact that the N. E. A. pupils were likely to make more errors in Test 4 than the Websters. Any psychologist could explain why. They had had five lessons on a phonetic key in some details new, in some details strange, in some revolutionary. They had not been shown how to learn nor how to apply that key, which would have opened the fortress with ease, but had to make the assault by sheer force of memory. In spite of their faster progress, they had not, during the previous week, got their alphabet so well in hand as the Websters had got theirs. If they tried, as in most cases American curiosity would have led them to try, to find out something about the N. E. A. key outside of the learning periods, they were balked in the effort. Naturally, with their key not so well learned, they could not retain it so well. Naturally, they were more easily confused. Naturally, they were more easily thrown into panic. If the director of the test, in calling for the symbols, used the letter-name and not the sound alone of the vowel in the key-word, the children were misled outright.

Naturally, they suffered a more severe defeat. But their defeat proves nothing, except that they were improperly directed in the learning and in the application of their key, and were not given a thorough, a close enough knowledge of it. They were taken only five blocks instead of six, and at a distance of one block away they could not tell the time marked by any watch, however accurate the watch was, and however clear the figures on its face.

Test 5 need not be reviewed; Dr. Whipple dismisses it.

Test 6 is another matter. It "was administered three days after Test 3. . . . It consisted in actual tests of pronunciation of the characters peculiar to the two keys. . . . The Proposed Key was represented by 23 symbols peculiar to it, the Webster by its symbols for the same sounds, plus a 24th symbol, [that for] the *e* of *maker*."

Test 6 offered a much increased latitude for error over that of

previous tests. Instead of recalling words and writing them down, the children were required to recall and to reproduce sounds, and the experimenter to recognize and classify those sounds. Now, the difficulty of making given speech-sounds correctly is, for child or adult, very great unless the person has had pretty thorough training of the speech-organs; and the accurate and unfailing recognition of speech-sounds, when made, lies only in the power of a phonetician. With the best intentions and will on the part of both children and experimenter in this test, there was room for repeated error in the making and the recognition of sounds. Whatever measure of uncertainty in this way arose in the child's mind naturally tended to lead him to take refuge in his assured knowledge of alphabetic and pronunciation values.

The pupils tested with the N. E. A. key were, as already recognized, less at home in their key than the other group. The tests were oral, and therefore more trying on the nerves. The time was restricted; it averaged five minutes (supposing no time lost in the exchange of pupil for pupil) for each child, and about thirteen seconds for each symbol. It is clear that the disadvantage under which the N. E. A. pupils labored—acquainted with fewer of their symbols, having on the average a shorter acquaintance with each symbol, some of those symbols being in direct contradiction to all their previous ten years' home and school experience with the English alphabet—must have been appreciably augmented; to what extent, a psychologist might say. It is only reasonable to expect such a result as the test gave.

The results of all the tests in Experiment A, given in detail in Dr. Whipple's Appendixes A and B (pp. 27-30), and summarized in Tables 1 and 2 (pp. 5 and 8), prove only that neither group had learned its key; that the N. E. A. group, which had more to learn at the start, had also more to learn at the close, although in the brief period in which comparison is possible they learned a greater number of the symbols, which at the beginning were unknown, than the other group; that the knowledge gained by the N. E. A. group, which was based on an average briefer acquaintance with their symbols, was not so stable; and that the tendency of both groups, with their imperfect knowledge of the symbols, was to interpret the letters of the symbols in their alphabetic and pronunciation values.

Experiment A does not prove that, if the instruction of each group had been carried to the point of reasonable attainment, the relative efficiency of the N. E. A. alphabet would not have been found to be in far higher degree than its relative (and indeed only apparent) difficulty of learning. Experiment A does not prove that, if the N. E. A. vowel-scheme had been taught from the point of view of its simplicity, consistency and harmony, it would not have been found at every stage easier to learn than the Webster, even for persons who had already fixed in mind conventional associations of letter and sound that are repeated in the Webster key. Experiment A does not prove that, if the N. E. A. alphabet were made use of where such an alphabet ought to be used, namely, in the first steps of a child in learning the art of pronunciation, as a preliminary to reading, the alphabet would not have shown astonishing superiority over any alphabet of the Webster kind.

Finally, Experiment A does not prove that, if the experiment had been based upon the use of the whole alphabet as the two keys represent it, the N. E. A. alphabet would not have been found superior even under the extreme conditions in which the experiment placed it.

On the other hand, the experience of language teachers in Europe, and in Great Britain, extending through years, does prove that a rational phonetic alphabet, such as the N. E. A., is by far the easiest to learn and to apply.

Some further points in Dr. Whipple's description of Experiment A deserve attention.

The experimenter (footnote, p. 5) lays stress upon the fact that the portion of the Webster key that was used contained two more symbols than the portion chosen of the N. E. A. Those two symbols were *ē* and *ng*. The latter could not be misinterpreted by any English-speaking child; but, as a matter of curiosity, one wonders how Dr. Whipple got the children to distinguish between the Webster symbols *ng* and *ŋ*. If the tests averaged three on *ŋ* and three on *ng*, it would be simply equivalent to testing the pupils on *ŋ* six times, and three of these times telling them what *ŋ* meant. As for *ē*, the fact of the peculiar form of the diacritic and of its occurrence only once in the list of symbols and in association with a perfectly familiar suffix *-er*, accounts for the ease with which it was fixed in memory. To make matters worse for the

N. E. A., the experimenter wrongfully opposed this Webster $\tilde{e}$ to an N. E. A. new symbol of different value, namely, u . It is little wonder that the children had increased difficulty with the N. E. A. u . After Tests 1, 2, and 3 had shown the symbol $\tilde{e}$ to be fixed in the pupils' minds, its inclusion in Test 6 helped materially in the good average showing of the Websters under that test.

The experimenter discovers that the three new letter-forms in the N. E. A. key, a θ u , proved to be less practical than the Webster diacritics. The results in his hands were the outcome of the fact (1) that these were new forms, and (2) that, as they were presented to the pupils they grew in number to nine new forms, $\bar{a}$ a ai au $\bar{e}$ θ ei u $\bar{u}$. If the pupils had been properly instructed, had been led to notice that ai au ei consistently stand for the combined sounds, a and i , a and u , θ and i , respectively, and that the macron involved no change of sound but only of length, the N. E. A. scheme would unquestionably have been found easier than the Webster. But with the new symbols presented to them as members of a long series, with no explanation of their fixed significance and consistent combinations, the pupils had to learn them as every one must learn the Webster signs, by sheer exercise of memory. It was a gross and inexcusable waste of energy.

Beside Dr. Whipple's confident assertion based upon experiments covering a total of *hours*, let us put the opinion of three only among the many who say that diacritic forms should be avoided, that new letter-forms are always to be preferred. These three are quoted on pp. 15f. above. Their combined teaching experience extends through a total of more than seventy or eighty *years*.

Finally, the experimenter's exclusion of the symbols for the "obscure" vowels (cf. pp. 12-14 and 51f. above) condemns beyond defense Experiment A, along with all the other experiments based on his partial keys, as, for example, Experiment B, next to be considered.

Experiment A must be set aside.

EXPERIMENT B

Experiment B was made with college students. It is assumed by the experimenter that these students had no appreciable knowl-

edge of the value of the Webster symbols, and that, on the other hand, all of them, because of their recent studies in foreign languages, were inclined to interpret any given symbol on the European basis of values. The conditions of the experiment are assumed to favor the N. E. A. key, if either.

The American college student who has studied one or more foreign languages to the extent and in the manner that prevail in most schools in this country, can not be found who speaks a foreign language with the facility he has in his own. To say otherwise would be preposterous. One can not be found who can read aloud even simple sentences in a foreign language with as much facility as in his own. One can not perhaps be found who can say over the foreign alphabet with as much ease, speed, and certainty, as he can say his English abc, although he may not have "said his abc" in English since he was five years old. Probably one can not be found to whom the letter *a* does not first and at once suggest the sound in *ale*; only upon afterthought will he associate any other sound with it. If the English key-word is given, the afterthought will not come to him. To any one who takes up the study of a foreign language after his native speech has become a habit, his knowledge of the foreign speech remains forever left-handed. There are few if any exceptions.

The conditions of the experiment with college students, then, were practically the same, though not so extreme, as of that with the grade pupils. The same underlying errors of method vitiate the experiment and weaken the significance of its results.

The college students had less difficulty than the grade students in bringing themselves to accept and use the vowel signs in their European values; but they were still subject to the influence of long-ingrained opposing associations and of the English key-words before their eyes. Since they left the seventh grammar grade, time had only made them the more familiar with English — with a wider range of English spellings and their multiplied repetitions of letter-combinations and values used in the Webster key. To conclude that European values lay nearer to hand for them, is quite unjustified. Every day they had a hundred times as much experience in speaking, reading, and writing English as they had in foreign language work. Dr. Whipple's own figures (in his Appendixes G

and H) furnish full proof of their English bias. Compare also pp. 42-48 above.

For them, as for the grade pupils, the N. E. A. alphabet was in some of its elements new and strange; and they were also no more properly instructed than the grammar pupils in its principles and its consistent structure. They, too, had to *memorize* the N. E. A. scheme as they had to memorize the Webster. The results for them could not have differed, except in degree, from those reached by the younger people.

The greater maturity of the college students, and their partial familiarity with the European values of the conventional vowel signs, made the N. E. A. alphabet relatively easier for them than for the grade pupils; but their maturity was equally an asset in learning the Webster key. Their one N. E. A. advantage, then, namely, their left-handed facility with European vowels, is alone to be taken into reckoning. It can not be assumed that this was a more important factor in the results than their ingrained and unconscious predisposition to interpret symbols in the values suggested by English alphabet names and key-words, combined with their greater familiarity with symbols of the Webster kind. These their eyes had met here and there. They may not have stayed to interpret the symbols, but the symbol forms must have in time become in some degree familiar to the eye.

The one help that the N. E. A. key had in the hands of the college students which it did not have in the hands of the grammar pupils — namely, the measure of familiarity that the former group had with European vowels — was not enough to overcome the advantages that favored the Webster key, namely, the fixed predisposition of the students to assign English values to letters and combinations of letters, and their inevitable acquisition of some familiarity with Webster symbols in the course of their previous schooling. That help, moreover, was offset by the wider range and severer conditions that the experiment was made to include.

For reasons that obtained in the memory tests of the children, the college students too had a less stable hold upon some of the N. E. A. symbols. The newness of those symbols must have time to wear off. It is true that the students ran over the list of symbols till each could translate them without error; and that a day later

the procedure was repeated; but altogether it was not a sufficient time for them to become anything like as familiar — as much at home — with the wholly new N. E. A. signs as with the corresponding Webster symbols. And so the N. E. A. key, as compared with the Webster, labored under a measure of greater unfamiliarity, which, in the conditions of the various tests, became a serious and decisive handicap. The two keys had not “been brought to the same stage of mastery.” “Brought to the point where they could *just* repeat without error the special symbols of the key they had been studying, when shown in chance order,” the students were *not* “then equally prepared, so far as knowledge of the keys is concerned.”

That associations previously fixed in mind, and freshened during the progress of the experiments, were noticeable determinants of the results is evident from a study of Dr. Whipple's Appendix C; hence it is important, in attempting to interpret the figures in that table, to take into account, so far as Dr. Whipple's meager information makes possible, the previous preparation of each student for the various tests, and the probable mental activities of each during the eight days that the experiment lasted. In doing so one is at Dr. Whipple's mercy, because Dr. Whipple has given data so inadequate. A phonetician, one with even a limited knowledge of phonetics, would have realized the vital bearing of such data upon the problem, and would have supplied the information in as full detail as possible.

Eighteen college students were chosen for the experiment. Of these, four are reported as having “no knowledge at all of the Webster system,” and one as knowing “no Webster symbols.” Does this mean that these five students went through primary, grammar, and high school without using a textbook in spelling, reading, geography, or history that contained a Webster or some similar respelling of new or strange words? The Webster system, we are told, is “in common use,” and the adoption of the N. E. A. alphabet would throw out of use the mass of these books. And are we to believe that these five students had reached college years without having opened any Webster dictionary from the Primary to the International? The long series of Webster dictionaries has done definitely more than that for most American youths of about

nineteen. It is true that the Funk & Wagnalls dictionaries have been in use long enough to have served these young people. Perhaps they used the *Standard*, or none at all.

It is certain that every one of these students who passed through American schools in preparation for college met repeatedly with Webster and similar respellings; that they imbibed consciously or unconsciously some knowledge of such systems—not as “systems,” because keys like the Webster are not systematic—but as attempts to indicate pronunciation by an assemblage of so-called phonetic signs.

Suppose that you had been in San Francisco several years ago, and had from time to time seen a number of Chinese on the street, some of them frequently. On the first day you would have noticed few differences in their faces; they would have all looked alike to you. But day by day, without conscious effort on your part, as a result merely of the image falling casually upon the retina, one, and then another, and then another would have become in a degree familiar to the eye. If you were now asked whether you *know* any Chinese in San Francisco, you would say, No. You had never met any of them individually, never spoken with one, never learned the name of one. But if you met a number of them to-morrow, mingled with some Japanese, and sought to make the acquaintance individually of the company, the Chinese faces that years ago became in a measure familiar to you would far more readily differentiate themselves in your mind than the newer Japanese. You would come to know Wan, and Tu, and Thlee, and Fo, as *men*, appreciably sooner than you begin to single out the Japanese. In like way these five college students who thought they knew nothing of the Webster alphabet had nevertheless for years been more or less accustomed to that type of face—or (typographically) to faces of that type—and when the time came to learn their names it was distinctly easier to attach name to face than it was in the case of the new N. E. A. crowd that was now for the first time, and in mass, encountered.

Two of the eighteen students had, one no knowledge of, the other no drill in, phonetic systems. But they were in the same boat with the five who thought they knew no Webster symbols.

Six of the eighteen students (Do., Sa., Mo., Wa.¹, of Cornell, Mc., Bas.) had some specific knowledge of the Webster, in addition

to that picked up (consciously or unconsciously) by years of use of schoolbooks and dictionaries in which Webster or similar respellings occurred. It is far easier to freshen old impressions on the mind than to engrave new ones.

Two of the eighteen had "some knowledge of phonetic systems" (Wa.² of Missouri, Bl.) and one "a slight knowledge of phonics" (Mat.). Did Dr. Whipple try to find out what kind of phonetic signs these had used in their study of phonetics? A few years ago the leading American phoneticians, each in his own way, still employed systems of phonetic signs largely diacritic. They have reformed that now. But such reforms spread slowly among hard-worked teachers. Until Dr. Whipple finds out, or (if he already has the information) makes it known, that these students used a modern rational alphabet like the N. E. A., one is justified in assuming that whatever phonetic symbols Wa.², Bl., and Mat. used were largely diacritic symbols like the Webster, or else—what would differ from the Webster only in degree—conventional English spellings.

Finally, two of the eighteen knew the "long" vowels, one of them the "short" also; that is (presumably), they interpreted ā ē ī ō ū as N. E. A. ē ī ai ō iu, respectively, and (one of them) ă ě ĭ ǫ ŭ as N. E. A. a e ĭ ɵ u. In other words, one of them was prepared to give these ten Webster symbols invariably the Webster value, the other to do the like with the first five; which in itself gave the Webster a distinct lead.

Dr. Whipple, with exacter and fuller knowledge of the circumstances, may topple over some of these inferences; but it will still remain true that, on his own showing, six of the eighteen students had some specific knowledge of the Webster key, and that all of them certainly had more or less familiarity with some of its symbols. Refer again to Dr. Whipple's Appendixes G and H, and see to what extent college students are predisposed to interpret new and unfamiliar phonetic symbols in the alphabetic and pronunciation values of the letters. Dr. Whipple is there (Experiment C) proving that the Webster key is far more "natural" (and hence nearer to hand) than the N. E. A. key. In the present Experiment B, however, as in Experiment A, he assumes that the two keys have equal chance of being learned—that they start on an equal basis.

With Dr. Whipple laying great stress upon Experiment B, it is

necessary to question closely not only the individual preparation of each student for the work he was called on to do, but also the experimenter's manner of conducting the tests, and of using the results.

The eighteen students (twelve at Cornell, six at Missouri University) individually met a director or instructor five times.

(1) At the first of these sessions (the Preliminary Session) the student "learned the twenty symbols that were common to both keys. These symbols were exhibited in enlarged form, one at a time, and sounded, first by the experimenter, then by the student. The series was repeated until the student could, unaided, sound correctly all these symbols. This preliminary work cleared the way for the learning of the symbols peculiar to the two keys."

Apparently no record was kept of the number of repetitions necessary, nor of the number of errors made, in this learning of nearly half of the symbols in each key.

(2) At his second session (the "first Regular Session") each student was taught "the 24 symbols of Key 1 (or Key 2)."

That is, nine of the students learned twenty-four additional symbols in the Webster key, and nine learned twenty-four additional symbols in the N. E. A. key.

In this session, *in which twenty-four out of forty-four symbols were used, a record was made of both repetitions and errors.*

(3) At his third session (the "second Regular Session"), one day after the preceding meeting, each student was first tested again on each of the twenty-four special symbols of the key used in that preceding session, in the same order in which the symbols had been first presented.

A record was made of the repetitions needed to bring the student back to errorless recital of the values of these twenty-four symbols in this order, and of the errors made in the repetitions.

In this same session the student was next tested in the same way upon the same symbols, but the symbols were thrown into chance order.

A record was made of repetitions and of errors.

Nine of the students were now regarded as having "learned" forty-four symbols of the Webster key, and nine as having "learned" forty-four symbols of the N. E. A. key.

(4) and (5). One week later than his first and second "Regular Sessions"—(2) and (3) above—each student again met the instructor, and was taught twenty-four additional symbols of the key that in the "regular sessions" of a week before he had not had in hand. There were two sessions, conducted in the same way as the Regular Sessions of the first week. At the end of these fourth and fifth sessions, nine students who had "learned" the Webster key in the first, second, and third sessions, a week earlier, were now regarded as having "learned" the N. E. A. key; and nine who a week before had "learned" the N. E. A. key were now regarded as having "learned" also the Webster key.*

Now, Dr. Whipple in Appendix C, summarized in Table 3, p. 14, professes to show the comparative ease of learning *the two keys*. And in the conclusion drawn from Table 3, and announced in italic print, he says: "*Speaking exactly, we find that the learning of the Proposed Key by college students exacts 41% more repetitions, with 85% more errors, than the learning of the Webster Key.*"

Here lies an error. The figures in Table 3, and hence the percentage calculated from them, are for each key based upon *work with only twenty-four* of the forty-four symbols. The keys, as Dr. Whipple used them (he excluded in all his experiments the "obscure" vowel signs) each contained forty-four to forty-six symbols. When he speaks of the "comparative ease of learning *the two keys*," his words refer, must refer, and ought to refer, to at least forty-four symbols. When he says "the learning of *the Proposed Key* . . . exacts 41% more repetitions, with 85% more errors," his words refer to forty-four N. E. A. symbols, but his figures are based on tests *with only twenty-four* of those symbols. The result is *to falsify the conclusion by raising the percentages*.

Suppose you have two fishing rods, each in two parts. The butt of each is two feet long. The tip of one is two feet long, of the other is three feet long. Evidently, one *tip* is fifty per cent longer than the other tip; but one *rod* is only twenty-five per cent longer than the other. When you express the length of one of these rods in terms of the length of the other, but use in your statement a percentage that you get from a comparison of the two tips alone,

* In each case it was only a part of each key that was taught. The symbols for the "obscure" vowels were excluded.

you double the percentage; you overshoot the true figure by 100 per cent of itself.

In exactly the same way, Dr. Whipple has determined, in Experiment B, the comparative ease of learning the two keys. He does not give the length of the butt that is an essential part of each rod, so that one can not correct his figures. In a later case, however, Dr. Whipple has repeated his blunder, namely in choosing for Table 7 figures measuring the errors made with a portion only of the symbols used in Test 3, to obtain a percentage unfavorable to the N. E. A. key, and then applying this percentage to the key as a whole. In that case we have, in Appendix F, figures for both parts of the rods, and we find that Dr. Whipple's way of measuring fishing rods *raises* the percentage against the N. E. A. key *from 18.6 to 35!* It is not impossible that his blunder in the present instance (Table 3) had effect in like proportion.

One can not find in Dr. Whipple's report of his experiments an error or blunder that redounds to the advantage of the N. E. A. key. There are several that do not. One could interpret the fact as indicating on the experimenter's part a hostility to one of the keys that is not scientific in temper.

To return to the examination of Dr. Whipple's method of conducting Experiment B:

"In the first regular session [that is, the first session devoted to the twenty-four special symbols of one or the other key], the experimenter, in the first reading, taught the students the 24 symbols of Key 1 (or Key 2), by showing enlarged symbols, in order, one at a time, giving the sample key-words (written for this purpose on the back of the cards, and hence visible to the experimenter, but not to the student), explaining the sound, and directing the student to pronounce it.

"The experimenter, in the second reading, then repeated the series as before, save that the key-word was not given. The symbol was shown, pronounced by the experimenter, and then repeated by the student.

"In the third repetition of the key, the experimenter merely showed the symbols, while the student pronounced them. In case of error, the experimenter promptly corrected it, and at the same time gave the student the key-word once more. These errors were

carefully noted, so as to furnish a record of the number of errors and of the symbols that occasioned them.

"If any errors were made in this third repetition of the key, the experiment was continued, in the same manner, so that the first session closed only when the student could sound correctly, upon presentation in regular order, the 24 symbols in the key. The speed of learning was thus measured by the number of repetitions needed to learn the key and by the number of errors committed in the process. The total number of repetitions includes the first two readings, in which the student followed the pronunciation of the experimenter." (Whipple, p. 12.)

One would like to know more fully just how these sessions were held.

Were these students summoned to a room together (twelve at Cornell and six at Missouri), informed of what was sought to be done, and then left together while one at a time was called into another room for his "preliminary session"? Or, after receiving information about the experiment, were they left to go where they pleased?

Or was each called from work in a class-room? Or was an appointment made for each at a time when he was free from class-room duty?

At the close of the "preliminary session" was each told to report for "the first regular session" on the next day? and was he told what for?

At the close of the "first regular session" was each asked to return at a given hour on the next day? and was he told, or left to infer, that the next day's work would be a repetition of the work just done?

Did any student know, or learn, that any other student was doing the same or similar work?

Was each student told that his study of the keys was to be limited to the private sessions with the director, that he was not to look for nor obtain information in any other place nor in any other way? and did all the students observe that limitation?

That is to say, were there time and opportunity for any student to inform himself of what he was to do, and to confer with any other student or with outsiders, or to give any private study to either of the keys?

Did the experimenter undertake to prevent any student from obtaining or receiving information outside of the private sessions? or to find out the extent and character of such information, if it were obtained?

These and other questions are not impertinent. They suggest themselves to every one who realizes what precautions ought to surround such an experiment.

Five minutes' private study of either key by a student of college maturity would materially increase his familiarity with it. Neither key (if you leave out the Webster "obscure" vowels) would be hard to learn.

The experimenter will say that the chances for each key were equal. But they were not. Aside from knowledge of the Webster that six of the students got in their elementary training, and the familiarity with the Webster symbols that each of them might readily get from the easy association of certain Webster symbols with conventional spellings, the Webster key itself was at hand in every copy of the 1909 edition of the dictionary. The N. E. A. key was not in print except in pamphlets hardly accessible to these students, though an approach to it was used in the *Standard Dictionary*. Furthermore, in their general reading the students might run across respellings of the Webster kind, but not of the N. E. A. kind. When the mind is once alert, slight impressions become significant.

A glance at the records of these students, as given in Appendix C, suggests the question as to how far factors outside of the limits assumed for the experiment itself entered into the problem and influenced the results. The records of six of the eighteen provoke the question.

The students (with two exceptions) who had in hand first the Webster key and a week later the N. E. A. key, found that in their first trial with the latter (at the first regular session devoted to it) the N. E. A. key was easier to learn.

The students who learned first the N. E. A. key and a week later the Webster, found the Webster in like manner easier at their first session with it.

These results are not without explanation. Six of the students, however, made such striking records that one can not help putting the question as to whether these students did not in the week inter-

vening between their learning the one key and their learning the other inform themselves by private study or otherwise about the key of the second week's exercises.

Five of these students worked first with the N. E. A. key, and required, to "learn" it, a total of 81 repetitions with 158 errors. A week later, at their first trial with the Webster key — that is, after having seen each symbol twice, pronounced each twice, and seen each key-word once — every one of the five was able to pronounce the symbols, when displayed in regular order, without error; and the five "learned" the key in a total of twenty-eight repetitions with three errors. The number of repetitions is exaggerated; for all but the first two repetitions were for the purpose not of learning but of testing knowledge; and the tests showed that the key was already "learned." To this there were two exceptions: Bas. made one error with the symbols in regular order, and one with them in chance order, so that these two errors forced him to make four repetitions instead of two to "learn" the key; Mu. made one error with the symbols in chance order, and so needed a total of three repetitions to "learn" the key.

The sixth of these special cases is that of Mc. Although he had had a little drill with the Webster key in primary schooling, he required twelve repetitions with twenty-one errors to learn the key. He was, then, no phonetic phenomenon. Nevertheless, a week later, at his first trial with the N. E. A., having previously read it through twice, he recited it without error, and altogether made only two errors in the two sessions given to "learning" it.

These six remarkable performances can hardly be attributed to the inherent virtues of either key. They force the question whether scientific precautions guarded this supposedly scientific experiment.

Another question, one that the layman may think unimportant, but which is really vital, and here pertinent because the experimenter several times shows that he is unfamiliar with the phonetic side of his problem, is this: When the experimenter gave the key-word for (say) the Webster symbol *ē* or the N. E. A. *ī*, what, exactly, did he say? Did he say, as he appears to have said in Test 3 of Experiment A (see p. 58 above), "Here is the symbol for the *e* [giving the letter-name] in *eve* and the *i* [again the letter-name] in *marine*"? We should like to take it for granted that the ex-

perimenter said, "This symbol represents the *vowel-sound* heard in the word *eve*, and in the second syllable of *marine*." But it is possible that the experimenter gave only one of the two key-words; in which case it is important to know which one. And if both were given, which was given first? Were they presented with equal prominence and emphasis? It ought not to be needful to suggest these questions to a psychologist, but other details in the experiments prompt them, and justify them. The questions apply to five vowel-symbols, and one must know the exact words of the director when presenting these symbols before one can know whether the experiment was really scientific, unprejudiced.

It must be strenuously emphasized that such experiments as Dr. Whipple undertook can be properly made only by a man who has the training of an expert phonetician, in addition to other qualities necessary to insure unbiased conditions and methods.

Now consider the tests used to measure the facility with which the respective keys were used. Keep in mind that, for reasons manifold, the Webster key should have been nearer to hand and more thoroughly mastered than the N. E. A. Among these reasons, the isolated, independent, literal, absolute superiority of the Webster can not be included, for it has not been demonstrated, and it is, moreover, rendered exceedingly doubtful by the fact already mentioned, that phoneticians everywhere, and language teachers abroad (when they employ a phonetic key), use no key of that kind.

In Test 1 the foreign appearance of the proper names undoubtedly helped the N. E. A. alphabet; but whether that help was enough to offset the advantage accruing to the Webster by reason of the instinctive tendency on the part of the students to interpret symbols in conventional English values, can not be told. Both factors were real quantities, but neither can be accurately measured.

Test 2 put a series of nonsense syllables before the students. The tendency of all to whom English was native was unquestionably to associate the syllables with some possible English syllable—word (or part of word), prefix or suffix. The tendency of all to whom the Webster key was the more familiar (15 to 17 out of the 18 students) would naturally have been to give the Webster interpretation wherever possible. The results of the test were, therefore, a foregone conclusion.

Test 3 is on the same footing as Test 2. In his summary of its results, however (Table 7, p. 19) Dr. Whipple falls into an error more grievous than his wrong handling of the figures reached by Tests 1 and 2 in Experiment A—an error already committed by him in Table 3, and the inferences drawn from it (see pp. 69–71 above). In the paragraph introducing Table 7 he says:

"The results are detailed in Appendix F, and summarized in Table 7. In the detailed results, distinction has been made between errors that involved one of the 24 special symbols peculiar to each key and errors that involved one of the 20 symbols common to both keys; these are differentiated as key errors and common errors, respectively. In Table 7, the common errors have been disregarded. The existence of a considerable number of them gives further evidence of the difficulty of this test as compared with the others that were employed."

Now notice closely how the figures are handled. First we are told that the results are "summarized in Table 7." Then we are told that "*the common errors have been disregarded in Table 7.*" (Table 7 can not, then, summarize *all* the results.) Then, in the subhead of Table 7, the table professes to be a summary "showing use of the keys" (neglecting, mind you, to state that it is really only *parts* of the two keys) "in phonetic transcription." Finally, we have the italicized conclusion: "*Speaking quantitatively, the application of the Proposed Key*" (neglecting, mind you, to state that it is only *part* of the key) "*takes 12% longer and involves 35% more errors than the application of the Webster Key*" (neglecting, mind you, to state that it is only *part* of the Webster key).*

To limit one's calculation to the figures one obtains from only a part of the two keys, and to base one's percentages on those figures, and then to announce one's conclusion in words that apply to the *whole* of the keys as used in the experiment, is to mislead the reader. If done knowingly and intentionally, it would deserve an ugly name.

* In reality, since Dr. Whipple in all his experiments used only 44 to 46 symbols in either key, his statements here are so worded as to apply to even more than those 44 or 46 symbols; for the N. E. A. key contains 47 symbols, the equivalent Webster 57 symbols. Hence, Dr. Whipple in Table 7 takes his percentage from figures based on about *half* of the N. E. A. key, and *less than half* of the Webster. That is not the right way to measure fishing rods.

The keys are intended to be used as wholes, and as wholes they should be compared. Let us revise Table 7, incorporating in it also the errors that Dr. Whipple calls "common errors." Of these there were made, with the Webster key, 53 *plus* 52 by the Cornell students, and 26 *plus* 31 by the Missouri students, a total of 162 errors; and with the N. E. A. key, 38 *plus* 56 by the Cornell students, and 19 *plus* 35 by the Missouri students, a total of 148 errors. Adding these figures to the totals that Dr. Whipple has inserted in Table 7, we have a complete table, which really shows "the use of the keys in phonetic transcription" (excluding, always, the symbols for the obscure vowels):

INSTITUTION	Number	WEBSTER KEY Total Errors	N. E. A. KEY Total Errors
Cornell	10	269	316
Missouri	6	156	188
Both	16	425	504

The difference between 504 and 425 is 79, which is 18.6 per cent of 425. When one, therefore, leaves out the errors in symbols common to the two keys, the result is to falsify the percentage against the N. E. A. key *by raising it from 18.6 per cent to 35 per cent.*

Further, this experiment, like all those that Dr. Whipple made, does not admit any test on the symbols for the "obscure" vowels, a part of the Webster key that is so confusing, chaotic, and obscure that it can neither be learned nor applied even by an expert phonetician. This feature alone of Dr. Whipple's experiments condemns them as grossly biased. The responsibility for it, however, may lie rather in conditions that were at the very beginning laid out for the experiments, and were accepted by the experimenter in ignorance of their bearing upon the problem.

Experiment B, like Experiment A, is of little scientific value.

EXPERIMENT C

"The *object* of this experiment was to ascertain to what extent and how accurately school children who had had a certain amount of phonic drill would interpret in the Webster Key monosyllabic

words printed in phonetic form and containing a symbol that might be given an interpretation in the Webster Key or in the Proposed Key. For example, the phonetic word 'stil' would be interpreted as *style* in the Webster Key, but as *steal* or *steel* in the Proposed Key.

"A second object was to see what pronunciation would, in the absence of instructions, be given naturally to certain symbols of the Proposed Key that are not common to the Webster Key."

A second part of the experiment was to determine the action, under the same tests, of a "group of college students who had had little or no formal"—that is, some of them had had some formal—"instruction in the Webster Key, but who had had on the other hand definite formal instruction in the pronunciation of one or more foreign languages with the Continental vowel values."

The school children, of the *Fourth* Grade, "had had a certain amount of phonic drill." Using what kind of phonetic symbols, if any? That question is vital. How thorough was the drill, and how definite and fixed its results? That question also is vital. If their phonetic symbols were of the Webster kind, the results of the experiment could have been nothing but Websterian. If their symbols were those of the conventional spelling, the results (with the words that were chosen) were bound to be almost wholly Websterian, because the children would have attempted to translate the phonetic transcriptions into familiar words, or, if such words did not readily occur to them, to give alphabetic values to the letters in the symbols when they could recognize these as letters. If their phonic drill had led to no definite, fixed results, the children in their uncertainty would have taken refuge in their knowledge of alphabetic and pronunciation values. In any case the experiment was futile. We wonder why—from Dr. Whipple's standpoint—it was made.

The experiment, Dr. Whipple says, "shows that, to grammar children at least, the intended interpretation of these [N. E. A.] symbols is not the natural one." *Natural!* That was just the word upholders of the English pronunciation of Latin applied to *it*. The question with them was not in what way the Romans probably pronounced their language, but in what way is it easiest for Englishmen to pronounce it. They were not seeking the *scientific* but the *expedient*. "Philological skill," one of them epigrammatically said,

"is not dependent on the accidents of utterance." He spoke as one knowing nothing of the physiology and psychology of speech. Speech-growth, speech-characteristics, speech-history, are to be seen not in letters but in sounds. To attempt a philological study of Latin, without approximating the Roman values of the letters of the alphabet it was set down in, is to read a page of Chinese as if it were English—from left to right along a horizontal line. The English pronunciation of Latin was—from the point of view of Latin philology*—preposterously unscientific and absurd. A "phonetic" alphabet based on English alphabetic values and English spellings, is—from the standpoint of phonetics—also unscientific and absurd, however "natural" it may seem to some people.

For a child to learn English sounds and their combinations into words, by means of the conventional alphabet and spellings, is to task the memory outrageously and override the child's instinctive sense of reason. To have him use a phonetic alphabet of the Webster kind—based upon alphabetic and pronunciation values, and put together without regard to a consistent choice and use of symbols in harmony with the physiological and phonetic interrelations of the sounds—is to sin against the child in the same way. The child's eye must learn to know a series of symbols in part unrelated or pervertedly related to one another and in part also inconsistently associated with individual speech-sounds. That is what led an eminent American linguist to refer to the Webster system as "ocular phonetics"—"run mad," he added.

When the mental attitude and action of a child thus trained is referred to as a test of the "naturalness" of phonetic symbols new to him—however scientific, fitting, harmonious, and clear those symbols are—the utterance is too naïve to be worthy of issuance from a scientific laboratory.

* Since throughout this discussion the subject is the use of a phonetic alphabet in the study of language, the term "philology" is meant in the sense of *linguistic study*. It is often extended to cover the study of the literature, life, institutions, etc., of the people who speak (or spoke) the language; and such study the "new method" in modern languages lays proper emphasis upon. But with this part of modern language study, which comes after a reading knowledge of the language is acquired, phonetics has to do only when historical study of the language is needed to throw light upon the past. It is in the first stage—the acquisition of a foreign language, and of the mother-tongue as well—that phonetics is of such great service.

This experiment, when tried on college students, some of whom have had some "formal instruction in the Webster key," and all of whom have a knowledge of the English alphabet and English pronunciation that has become instinctive and is incomparably nearer to hand than their total knowledge of foreign languages, can have no other result than with children. All that can be said of it is that it is possibly less absurd.

EXPERIMENT D

Experiment D is, as Dr. Whipple recognizes, inconclusive. It would not call for notice if it were not made the occasion for characterizing a certain Reader as "pedagogically unfit." In doing this Dr. Whipple seems for the time to speak in other than a scientific temper. If Dr. Whipple takes a scientist's attitude toward the problems that are admitted to his laboratory, he must recognize that a Reader intended to be used in a new way—a way recognized and adopted throughout Europe as the most efficient introduction to language study—can not be a "fit" instrument unless in the hands of a teacher who is familiar with the aims and skilled in the application of the new method, and who is, besides, in sympathy with the idea and the principles that inspired it. The difficulty of overcoming the inertia of the human mind is natural, but, at the same time, enormous. However willing, and however competent in his familiar methods of instruction, a teacher may be, he can not instantly adjust himself to a new method. And having perfected himself in the new method, he can not in a brief time demonstrate its merits. "When a man has been teaching for twenty years," says a writer on the pronunciation of Latin, in the *London Times*, April 2, 1907, "his mind is not apt to turn to pedagogical novelties." In *Die neueren Sprachen*, xiii, 349ff., one reads: "The importance of such an alphabet to the educated public can hardly be exaggerated. The reason that many scholars do not understand the truth of this statement is that they never had the opportunity, either in or out of the class, of testing continuously one phonetic system."

The "new method" has established itself abroad; it has proved its efficiency. The old method, however, is not inefficient. Even "readin', 'ritin' and 'rithmetic, well druv in with a hickory stick," are not without results. But that very old way led to an enormous

waste of energies and much turning of the milk of human kindness into gall. The American ways of to-day are immensely better. But some teachers among us are beginning to believe and to demonstrate that the "new method" of language study is still better. It is these teachers who wish, by the adoption on a national scale of a rational phonetic alphabet, to make it possible for American teachers to follow their European and British colleagues.

The need and the uses of that alphabet are thus stated in the "Report of the Joint Committee" (p. 11): "We need, the world needs, now, without further waiting, an adequate, simple, precise, unambiguous, and generally accepted notation that we can teach to the young in school, thereby training their vocal organs and leading them to pronounce the language more accurately and intelligently, a notation that will at the same time facilitate our learning of foreign languages, and the learning of English by foreigners; a notation, finally, that will enable the educated adult to consult whatever good dictionary comes to hand and find out how a word is pronounced without referring to a special and peculiar "key to pronunciation."

The issue, then, is too important to be decided by Dr. Whipple's four experiments. Recognizing that the errors, and the unjustified conclusions, that are embodied in the published report of these experiments, may be ascribed to the lack of training on the phonetic side that the experimenter showed, nevertheless the resulting defects in the experiments condemn them. The fact that Dr. Whipple's conclusions, separated from their context and naturally, therefore, understood as applying with scientific and mathematical truth to the two keys as wholes, have been cited and may again be cited to influence opinion against the N. E. A. alphabet, has made it necessary to review in detail his published report. The least discrediting interpretation you can put upon the assumptions the experimenter made, upon the exclusion of parts of both keys from all the experiments, upon the application of percentages based upon tests with only a *part* of the chosen partial keys to the *whole*, not merely of the partial keys chosen, but of the actual keys—must stamp his work as really unscientific and without authority.

The N. E. A. key, as an English phonetic alphabet of medium precision, is admirably simple, consistent, and scientific. If learned and applied in the way its simplicity and consistency make possible,

it will offer less difficulty to any learner—child or adult—than a key like the Webster. Because much of it is new, it may, for one in whose mind associations of English sounds with English conventional spellings have become fixed, require an appreciable time in the learning. But when one is destined for a long journey, does one not save time by staying to saddle a horse, instead of starting out at once on foot? In fact, with the Webster kind of key one can never reach the legitimate goal to which a phonetic alphabet should lead. With it, one can never go outside of English; in English one can use that key only as a pronouncing key; and, even in this limited use, it is a make-shift. The Webster kind of key can not serve with maximum efficiency in the elementary study of one's mother-tongue, nor satisfactorily in the study of a foreign language, nor at all in the general study of phonetics, the basis of all language study. Such a key is both provincial and antiquated. It leads to a railroad station at the end of a branch line; the N. E. A. alphabet leads to an international railway center.

APPENDIX I

I. Joint Committee (Report published, 1904, by the Publishers' Printing Company, 32-34 Lafayette Place, New York).

Calvin Thomas, Professor of the Germanic Languages and Literatures, Columbia University, New York City.

George Hempl, Professor of Germanic Philology, Leland Stanford Jr. University, Stanford University, Cal.

Charles P. G. Scott, Etymological Editor *Century Dictionary*, Secretary of the Simplified Spelling Board, New York City.

O. F. Emerson, Professor of English, Western Reserve University, Cleveland, Ohio.

E. O. Vaile, Chairman, Standing Committee on Simplified Spelling of the Illinois State Teachers' Association. Oak Park, Ill.

II. Committee of the Modern Language Association on the Proposed Phonetic Alphabet [that proposed by the Joint Committee].

E. S. Sheldon, Professor of Romance Philology, Harvard University, Cambridge, Mass.

James W. Bright, Professor of English Philology, Johns Hopkins University, Baltimore, Md.

C. H. Grandgent, Professor of Romance Languages, Harvard University, Cambridge, Mass.

George Hempl, Professor of Germanic Philology, Leland Stanford Jr. University, Stanford University, Cal.

Raymond Weeks, Professor of Romance Languages and Literatures, Columbia University, New York City.

The report of this committee was concurred in also by the American Philological Association in December, 1905. See (A. P. A.) *Transactions and Proceedings*, xxxvi, p. xlv, and xxxvii, pp. xcv-cix.

III. Committee of the Department of Superintendence (Report published in "Proceedings of the Department of Superintendence,

National Education Association, Mobile, Alabama, February, 1911").

E. O. Vaile, Chairman, Oak Park, Ill.

T. M. Balliet, Professor of Science of Education, and Dean of the School of Pedagogy, New York University, New York City.

H. H. Seerley, President, State Teachers' College, Cedar Falls, Iowa.

Melvil Dewey, Founder, and until 1906 Director, of the N. Y. State Library School. Address, Lake Placid Club, N. Y.

Wm. H. Maxwell, Superintendent of Schools, New York City.

APPENDIX II

Resolution passed by the Modern Language Association of America, at the annual meeting in Chicago, December 28, 1911.

Resolved, That the Modern Language Association concurs in the opinion that a uniform fonetic alfabet for key purposes in general reference books in English is very desirable both from an educational and from a scientific standpoint. We hereby express, therefore, our approval of the alfabet recommended for the purpose by the Department of Superintendence of the National Education Association, and we join with that body in urging its general adoption as rapidly as may be practicable.

Resolutions passed by the American Philological Association, in session at Pittsburgh, Pa., December 29, 1911.

Voted, That the American Philological Association, in hearty sympathy with the movement to introduce into our popular works of reference a uniform key alphabet, approve the alphabet adopted by the Department of Superintendence of the National Education Association.

Voted, That this resolution be not construed as in any way abrogating the Association's approval, on December 29, 1905, of the original and more scientific form of this alphabet.*

Resolution passed by the American Dialect Society, in session December 28, 1911, at Chicago, Ill.

Resolved, That the American Dialect Society desires to express its cordial approval of the adoption by the Department of Superintendence of the National Education Association of a fonetic alfabet for use in general reference books in English.

* Proceedings for 1905, volume xxxvi, p. xlv.

APPENDIX III

The origin of the following letters is explained in the first of them. They are reprinted here because they furnish views of the Whipple experiments in part not covered in the foregoing discussion, and in part expressed in varying and convincing phrasing.

Cedar Falls, Iowa, Dec. 6, 1911.

Dear Sir:

Doubtless you have examined a copy of Professor Guy Montrose Whipple's printed report on an investigation conducted by him on the Relative Efficiency of Phonetic Alphabets.

As a member of the Committee that presented the Report on "The Universal Key Alfabet" to the Department of Superintendence at Mobile, Alabama, in February, 1911, I desire to have your views regarding the value of the Whipple tests as well as your reasons why the Department of Superintendence should not reconsider the action then taken. I wish to have the authority to publish these views if I desire to do so.

(Signed) H. H. Seerley.

Modern Language Association of America,
107 Walker Street, Cambridge, Mass.

December 9, 1911.

I have examined Professor Whipple's pamphlet, but cannot accept its conclusions as significant. In the first place, his results are contrary to reason. One has only to look at the two alphabets to see which is the shorter, the simpler, the easier to write, and the better adapted to mnemonic processes. I am convinced that any member of the N. E. A. could learn the Key Alfabet, and learn it for good, in fifteen minutes. I wonder how many could learn the Webster Alfabet in as many hours. I do not know it now, altho I have used it more or less all my life. Secondly there is nothing in Professor Whipple's report to indicate that in presenting the new alfabet any

effort was made to point out its logical coherence, which is its distinctive feature and the fundamental trait that distinguishes it absolutely from alphabets of the Webster type. To try to teach the new symbols in the same way as the old would be comparable to an attempt to teach a poem by giving out the disconnected words, like the entries in a column of a dictionary. The acquisition of the Key Alphabet, in the proper fashion, means a training in the actual sounds of our language; whereas the use of the Webster system perpetuates misconceptions as absurd as they are pernicious.

You have my permission to print my views, if you care to do so.

Very truly yours,

(Sigid) C. H. Grandgent.

Western Reserve University,
98 Wadena St., Cleveland, Ohio.
December 12, 1911.

In answer to your letter let me say that I have examined Mr. Whipple's report, but the manner of making the experiments, the short time in which they were in operation, and the apparently biased tone of the investigator give me little confidence in the results. I can not believe them true until they have been tested again and again. In fact, I have little doubt that the weaknesses of the method and the inaccuracy of the results will be pointed out in time.

It is to be hoped that the Department of Superintendence will stand by the "Key Alphabet." Newspaper gossip and a publishers' war are not reasons with thoughtful people for changing a belief once seriously accepted. No important arguments have yet been advanced why an attempt should not be made for some reasonable progress toward uniformity in alphabetic keys.

Very truly yours,

(Sigid) O. F. Emerson.

Columbia University,
New York City.

My opinion is that the Whipple "investigation" is quite inconclusive.

In the first place the tests were made by teachers evidently un-

trained in fonetics. In order to teach fonetics *with any alfabet* you have got to have teachers who know the subject.

In the second place, the tests were made with children who could read English and were thus already familiar with the so-called "English values" of the vowels. In order to give a comparative test of any real value, so far as mere quickness of learning is concerned, you would have to take children who had not learned to read at all.

In the third place, either notation can be learned in a short time by any capable child, and whether the one or the other takes a trifle longer to memorize is of no importance, if the one is really better than the other when you get it learned. If you were going to buy a watch to last you a life-time, you would not make the choice turn on whether the dealer's shop were five blocks away or six.

In the fourth place, the Whipple tests do not employ the alfabet correctly. *He leaves out the symbols for the unstrest vowels*, which are the strongest feature of the N. E. A. alfabet. You can't spell *scientifically* without some kind of notation for the unstrest vowels, and the Webster notation is simply chaos, the same sound being denoted in a variety of ways. Since Whipple's teachers did not themselves spell correctly with the Revised Scientific Alfabet, they could not teach their pupils to use it correctly, and any statistics of "error" based on such a rank sophistication of elementary fonetic facts are altogether worthless.

The one important question to my mind is whether the Revised Scientific Alfabet is, or is not, a better tool for the accurate showing of pronunciation than is the Websterian notation. On that point there is not the slightest doubt in my mind, nor, I imagine, in the mind of any one who knows the rudiments of fonetic science.

The alfabet adopted last winter by the Department of Superintendence of the N. E. A. is not perfect, and for purposes of high precision could be advantageously changed in some details of the vowel notation. But for medium precision, such as is needed in text books and dictionaries, where words are respelled to show how they are pronounced, it does very well and is immensely superior to the Websterian notation.

(Signd) Calvin Thomas.

Simplified Spelling Board,
1 Madison Avenue, New York.
December 16, 1911.

I have seen the pamphlet which reports the proceedings of Mr. Guy Montrose Whipple, an instructor in Cornell University, in experiments on what he calls "Relative Efficiency of Phonetic Alphabets." It appears that Mr. Whipple, with the aid of another teacher, undertook some experiments involving the use of the Phonetic Key Alphabet associated with the name of the National Education Association, and of an alleged fonetic alfabet consisting of the Key to Pronunciation used in what is known as Webster's Dictionary.

The experiments were begun soon after the action of the Department of Superintendence of the National Education Association at the end of February, 1911. They were so promptly concluded that it was possible to have a report of the same redy for use by certain book agents at the meeting of the N. E. A. in July.

The report shows that the pupils experimented upon were few in number and taken from few sources. The assumption was that the pupils were ignorant of the two alfabets used, and that the alfabet in the use of which fewer mistakes were made in the time given, would be thereby proved the best. Among the students experimented upon there were a few students of Cornell University. We are askt to believe that these students, who were deemd qualified to enter Cornell University, did not previously know anything about the notation used in Webster's Dictionary. As this notation in various forms, all bad, has been used in most dictionaries and most spelling books for two generations, it is a rather damaging charge against Cornell University. The fact is, that the notation in question, bad as it is, is known in part to every reader, so that any pupil of fourteen or eighteen or twenty years of age must enter such experiments with a prepossession of memory on the side of the Webster notation.

Of course such experiments, made so quickly, by only two persons, with only a few pupils, could not be conclusiv on either side.

Yours truly,

(Signd) Charles P. G. Scott.

Columbia University,
New York City.

For the Department of Superintendence of the National Education Association to abandon the proposed scientific alphabet would be on a par with the relinquishing by a government of the metric system, to return to an earlier, more cumbrous system. The teachers and the pupils of this country deserve the best, and should not be forced to ride in a medieval cart instead of a modern carriage.

The recent tests of the proposed alphabet and the so-called Webster key for pronunciation, conducted under the guidance of Assistant Professor G. M. Whipple of Cornell University, are no tests at all. When a philologist or phonetician reads this pamphlet he cannot fail to wonder that any professor in any university in the world could be brought to sign it. There is only one way for this pamphlet to avoid doing a lasting injury to Professor Whipple's reputation, and that is by its being promptly forgotten. If Mr. Whipple has any knowledge of the linguistic or philological side of the question, he has carefully concealed the fact. His experiment, as he performed it, would have been in place a century ago. To-day it is an anachronism.

Professor Whipple's tests have neither a beginning nor an end. He takes, for example, children who know how to read in English—whose acquaintance with our unfortunate vowel system has become fixed. He should have begun with pupils several years younger, who knew nothing of reading nor of our ordinary alphabet, and he should have continued his tests longer. He should, furthermore, have had, as supervisors of the test, teachers who knew both keys equally well, and who had some special training in phonetics. The lack of these advantages is not to be compensated for by any amount of good-will and honesty on the part of the teachers. Would Mr. Whipple approve a test of the metric system, as compared with the English system of weights and measures, if the pupils knew only the latter, and if the teachers had only a slight, recently acquired knowledge of the former?

The relative value of keys based on the English sounds of the vowels and of those based on the Latin sounds has been examined many times by European and American scholars. Even in conservative England, teachers and scholars would doubtless hear with sur-

prise that any one in America should favor the Webster system. There is no society of philologists or phoneticians in the world who would receive otherwise than with laughter or amazement a defence of the Webster key.

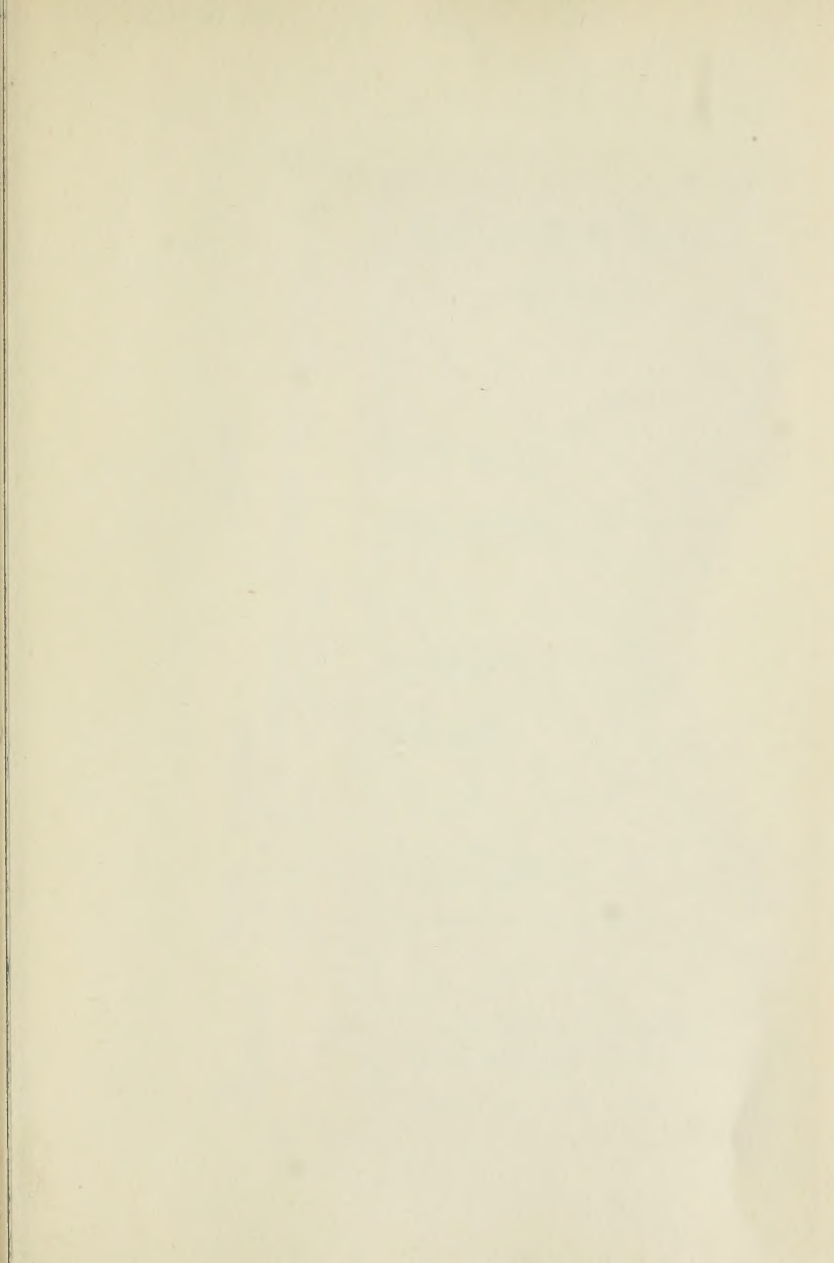
And what shall be said of the manner in which Professor Whipple leaves out of consideration the transcriptions for the obscure vowels in the two keys? We are dealing with symbols for popular, everyday use—with what are called alphabets of minimum precision. The proposed alphabet offers two symbols for these vowels, whereas the Webster alphabet offers probably eight or more symbols, a system so complex and impossible that it may be doubted whether any human intellect can master its mysteries. What children would do with these confusing and illogical symbols can be imagined. It should be added that, even among the experts, most phonetic alphabets for minimum precision give only one, or, possibly, two symbols for the so-called obscure vowels. Professor Whipple has amputated this entire section of the two alphabets. In other words, he has made his “tests” on a part only of the two keys, ruling out of consideration an important section in which the superiority of the proposed key is startlingly clear. I cannot believe that he knowingly committed such an act, which men of science would be the first to brand with infamy. His ignorance of linguistics is probably alone to blame.

Find a specialist—a phonetician, a philologist, or one informed as to modern methods of teaching English—and you do not need to ask his opinion; he is an enemy of the Webster key and of all its race.

(Signed) Raymond Weeks.









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The N.E.A. phonetic alphabet with a review of
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